

## 18. CYNANCHUM Linnaeus, Sp. Pl. 1: 212. 1753.

鹅绒藤属 e rong teng shu

*Alexitoxicon* Saint-Lager; *Antitoxicon* Pobedimova; *Cyathella* Decaisne; *Cynoctonum* E. H. F. Meyer; *Pycnostelma* Bunge ex Decaisne; *Rhodostegiella* C. Y. Wu & D. Z. Li; *Seutera* H. G. L. Reichenbach; *Symphyoglossum* Turczaninow; *Vincetoxicum* N. M. Wolf.

Subshrubs or perennial herbs, erect or twining, often rhizomatous. Roots fibrous, woody or fleshy. Leaves opposite, rarely whorled, often petiolate, axils sometimes with small stipulelike leaves. Inflorescences extra-axillary or occasionally terminal, rarely axillary, umbel-like, corymbose, or racemelike. Sepals erect, often with basal glands. Corolla rotate or subrotate; tube short; lobes patent or reflexed, overlapping to right or left, rarely subvalvate. Corona inserted at base of gynostegium, membranous or fleshy, cupular, cylindrical, or deeply 5-divided, sometimes with adaxial appendages. Filaments connate into tube, anthers with membranous apical appendages; pollinia 2 per pollinarium, pendulous. Stigma head convex or short conical. Follicles fusiform or lanceolate, usually smooth, rarely narrowly winged or setose.

About 200 species: Africa, North and South America, Asia, Europe; 57 species in China.

- 1a. Erect herbs, sometimes uppermost parts tending to twine.
- 2a. Corona tube cupular to tubular, at least as long as gynostegium, membranous, longitudinally pleated, white or near white.
    - 3a. Flowers produced after leaves are fully developed; corolla green-white; corona tube as high as gynostegium, marginal lobes linear-triangular; inner appendages well developed, as long as corona lobes; base of leaf blade cordate to truncate ..... 2. *C. anthonyanum*
    - 3b. Flowers produced before leaves are fully developed; corolla purple; corona tube much higher than gynostegium, marginal lobes very short; inner appendages absent; base of leaf blade rounded to narrowly cuneate ..... 3. *C. purpureum*
  - 2b. Corona usually deeply lobed, lobes fleshy, tube (when present) usually much shorter than gynostegium (well developed in *C. bicampanulatum*), not longitudinally pleated nor grooved, variously colored.
    - 4a. Leaf blade ovate, broadly ovate, ovate-oblong, or broadly elliptic.
      - 5a. Leaves (at least lower on stem) amplexicaul; stems and leaves glabrous or nearly so; inflorescences pedunculate ..... 31. *C. amplexicaule*
      - 5b. Leaves not amplexicaul; stems and leaves often hairy and/or inflorescences sessile.
        - 6a. Inner surface of corolla lobes and/or tube hairy.
          - 7a. Corolla lobes erect, slender but with a blunt apex; corolla glabrous except for conspicuously woolly tube ..... 37. *C. rockii*
          - 7b. Corolla lobes rotate, ovate; corolla indumentum variable but never with a conspicuously woolly tube.
            - 8a. Stems flexuous; leaves glaucous, leathery; corona lobes broadly ovate, broader than long ..... 33. *C. canescens*
            - 8b. Stems erect; leaves green, thin papery; corona lobes triangular-ovate, longer than broad ..... 35. *C. forrestii*
        - 6b. Inner surface of corolla glabrous, rarely a few hairs inside tube.
          - 9a. Corolla campanulate, tube as long as lobes, lobes apparently erect; corona tube as long as anthers, adnate to anthers and corolla ..... 36. *C. bicampanulatum*
          - 9b. Corolla reflexed to shallowly bowl-shaped with spreading lobes; corona tube much shorter than anthers, not adnate to corolla.
            - 10a. Corona lobes lanceolate, subacute, clearly higher than gynostegium, each lobe with a well-developed inner appendage incumbent on anther; leaf margin shallowly undulate ..... 26. *C. lysimachioides*
            - 10b. Corona lobes rounded, not higher than gynostegium, inner appendages not incumbent on anther or absent; leaf margin not undulate.
              - 11a. Leaves uniformly densely pubescent on both surfaces; corolla deep purple; inflorescences mostly sessile ..... 32. *C. atratum*
              - 11b. Leaves pubescent to puberulent on veins only at least on adaxial surface; corolla dull yellow or white; inflorescences pedunculate.
                - 12a. Corolla up to 1 cm in diam.; peduncles not longer than leaves ..... 34. *C. inamoenum*
                - 12b. Corolla 1.2–1.8 cm in diam.; peduncles longer than upper leaves; stems sometimes tending to twine at tip, leaves sometimes whorled.
                  - 13a. Corolla lobes ca. 3 mm wide; leaves abaxially puberulent on veins only ..... 47. *C. acuminatifolium*

- 13b. Corolla lobes 1.2–1.5 mm wide; leaves abaxially densely uniformly puberulent ..... 48. *C. pingshanicum*
- 4b. Leaf blade linear to narrowly elliptic or lanceolate.
- 14a. Most parts of plant densely puberulent, rarely leaves glabrous; corona with short but distinct tube and inflexed linear-oblong lobes ..... 1. *C. thesioides*
- 14b. At least some parts of plant sparsely pubescent to glabrous; corona divided to near base, with ill-defined tube and triangular-ovate, fleshy lobes.
- 15a. Inflorescences strictly lateral, longer than leaves; leaves 1–2 mm wide; corolla lobes oblong-lanceolate; corona deeply 5-lobed ..... 39. *C. wangii*
- 15b. Inflorescences terminal and from upper nodes or, if strictly lateral, shorter than leaves; leaves 5–15 mm wide; corolla lobes ovate or ovate-oblong.
- 16a. Peduncles 2.5–4 cm, often subterminal, longer than uppermost leaves; leaf blade with lateral veins ca. 8 pairs; corona lobes laterally compressed ..... 38. *C. paniculatum*
- 16b. Peduncles less than 2 cm, much shorter than leaves; leaf blade with lateral veins obscure or up to 6 pairs; corona lobes dorsiventrally compressed.
- 17a. Leaves leathery, glabrous, glaucous.
- 18a. Stems glabrous; corolla dark red ..... 40. *C. mongolicum*
- 18b. Stems pubescent; corolla yellow ..... 41. *C. glaucescens*
- 17b. Leaves membranous to thin papery, often hairy.
- 19a. Corolla hairy inside; lateral leaf veins ca. 6 pairs.
- 20a. Leaves always paired, veins glabrous; inflorescences racemelike, slender ..... 46. *C. stauntonii*
- 20b. Leaves often whorled, veins puberulent; inflorescences umbel-like ..... 43. *C. hydrophilum*
- 19b. Corolla glabrous; lateral leaf veins obscure or up to 4 pairs.
- 21a. Corona lobes adnate dorsally to corolla; inflorescences raceme-like ..... 42. *C. stenophyllum*
- 21b. Corona lobes free from corolla; leaves often whorled; inflorescences umbel-like.
- 22a. Stems glabrous; leaves 2–9 mm wide ..... 45. *C. riparium*
- 22b. Stems pubescent; leaves 7–15 mm wide ..... 44. *C. verticillatum*
- 1b. Twining climbers.
- 23a. Fruit winged or setose.
- 24a. Fruit densely and conspicuously setose, not winged ..... 15. *C. corymbosum*
- 24b. Fruit smooth, longitudinally winged ..... 19. *C. callialatum*
- 23b. Fruit not ornamented (not known for several species).
- 25a. Corona without inner free-tipped appendages, interior sometimes with longitudinal folds or wings.
- 26a. Stems uniformly pubescent, sometimes densely so, basal part often not twining, erect.
- 27a. Leaves linear to lanceolate, up to 2.3 cm wide, usually much less, adaxially with tiny pale dots ..... 1. *C. thesioides*
- 27b. Leaves narrowly elliptic to ovate, 2.5–10 cm wide, adaxially without dots.
- 28a. Lower part of stem erect, only upper part twining.
- 29a. Base of leaf blade rounded or subcordate; pedicel up to 5 mm ..... 50. *C. versicolor*
- 29b. Base of leaf blade cuneate; pedicel 1–2 cm ..... 52. *C. taihangense*
- 28b. Stems twining throughout.
- 30a. Pedicel 15–22 mm; corolla lobes ovate; 5–5.5 × ca. 3 mm; sepals glabrous ..... 53. *C. linearisepalum*
- 30b. Pedicel 5–13 mm; corolla lobes oblong, ca. 10 × 2.5 mm; sepals pubescent ..... 54. *C. mooreanum*
- 26b. Stems glabrescent or pubescent along 1 or 2 lines only.
- 31a. Corona fleshy, often deeply lobed; leaves concolorous, abaxial surface at most only slightly paler.
- 32a. Leaf blade linear, 0.5–1 cm wide; corona shallowly lobed, shorter than anthers ..... 49. *C. biondioides*
- 32b. Leaf blade ovate, 1.5–15 cm wide; corona deeply lobed, longer than anthers.
- 33a. Stems with basal part erect; leaf blade broadly elliptic to ovate, 4–15 cm wide, base cuneate ..... 51. *C. chekiangense*
- 33b. Stems always twining from base; leaf blade lanceolate or narrowly oblong, 1.5–5 cm wide, base shallowly cordate to rounded.
- 34a. Corolla purple or purple-red ..... 55. *C. sublancoelatum*
- 34b. Corolla white or yellow-white.
- 35a. Lateral leaf veins 4–6 pairs; corolla ca. 7 mm in diam., oblong,

- glabrous ..... 56. *C. fordii*
- 35b. Lateral leaf veins 7–10 pairs; corolla 12–15 mm in diam., lobes lanceolate, pubescent inside ..... 57. *C. volubile*
- 31b. Corona membranous, cupular, often with marginal lobes shorter than tube; leaves often discolorous with abaxial surface much paler.
- 36a. Corolla lobes hairy; corona tube shorter than prominent lobes.
- 37a. Corolla lobes ca. 10 mm; corona cupular, ca. 1 mm high, with 5 triangular marginal lobes to 3 mm high ..... 16. *C. megalanthum*
- 37b. Corolla lobes 2–5 mm; corona tube absent, lobes well developed, narrower at base.
- 38a. Leaf blade ovate or ovate-cordate, apex cuspidate, basal lobes incurved and sometimes overlapping; peduncle ca. 1.5 cm; corona lobes shorter than gynostegium, truncate ..... 22. *C. wilfordii*
- 38b. Leaf blade ovate-lanceolate, apex acuminate, basal lobes not incurved; peduncle to 3.5 cm; inflorescences dense, with flowers overlapping when pressed; corona slightly longer than gynostegium, rounded ..... 23. *C. otophyllum*
- 36b. Corolla lobes glabrous; corona tube longer than lobes, lobes sometimes rounded teeth.
- 39a. Corona ca. ½ as high as anthers; sepals reflexed at anthesis ..... 10. *C. brevicoronatum*
- 39b. Corona at least as high as anthers or only slightly shorter; sepals not reflexed.
- 40a. Leaves linear-lanceolate, to 11 × 1.2 cm, base cuneate; corona ca. 2.5 mm high; inflorescences umbel-like ..... 17. *C. kingdonwardii*
- 40b. Leaves ovate-oblong, 2–8(–10) cm wide, base cordate; corona ca. 4 mm high; inflorescences racemelike, cymules arranged in regular spiral along rachis.
- 41a. Stems pubescent along 1 line, hairs sometimes very sparse, or in 2 obscure lines immediately above node.
- 42a. Corolla ca. 3 mm; corona tube lower than anthers, marginal teeth prominent, almost acute ..... 12. *C. duclouxii*
- 42b. Corolla 3.5–5 mm; corona tube higher than anthers, marginal teeth low and rounded ..... 14. *C. kintungense*
- 41b. Stems pubescent along 2 lines.
- 43a. Corolla lobes erect ..... 13. *C. sinoracemosum*
- 43b. Corolla lobes rotate to strongly reflexed.
- 44a. Inflorescences to 3.5 cm, subsessile ..... 11. *C. wallichii*
- 44b. Inflorescences 2.5–7 cm, peduncle 1–5 cm ..... 15. *C. corymbosum*
- 25b. Corona with appendages inside, these free at apex.
- 45a. Corona deeply 5-divided, lobes fleshy, tube much shorter than gynostegium to absent, lobes erect or ascending.
- 46a. Peduncle much longer than pedicel.
- 47a. Corolla strongly reflexed ..... 30. *C. boudieri*
- 47b. Corolla rotate.
- 48a. Corolla lobes 4.5–5 mm, minutely pubescent ..... 28. *C. officinale*
- 48b. Corolla lobes (4.5–)5.5–8(–10) mm, densely pilose or villous ..... 29. *C. auriculatum*
- 46b. Peduncle up to 3(–4) cm, up to 2 × as long as pedicel.
- 49a. Corolla glabrous; leaf blade hastate, hastate-oblong, or narrowly ovate-deltate.
- 50a. Corona shorter than gynostegium, inner appendages ca. as long as lobes; leaf blade 7–14 × 3–8 cm ..... 24. *C. giraldii*
- 50b. Corona longer than gynostegium, inner appendages shorter than lobes; leaf blade 3–8 × 1–5 cm ..... 27. *C. bungei*
- 49b. Corolla adaxially puberulent; leaf blade broadly ovate to ovate-oblong.
- 51a. Peduncle 1–2 mm, much shorter than pedicel; base of leaf blade auriculate; corolla purple ..... 25. *C. batangense*
- 51b. Peduncle 20–30 mm; about as long as pedicel, base of leaf blade shallowly cordate; corolla white ..... 26. *C. lysimachioides*
- 45b. Corona distinctly cupular or cylindric, usually obviously membranous, sometimes plicate, tube as long as or longer than gynostegium and/or much longer than marginal lobes.
- 52a. Leaves pinnately veined, slightly fleshy.
- 53a. Inflorescences simple, umbel-like; peduncle 1–7 mm; leaf base cordate ..... 19. *C. callialatum*
- 53b. Inflorescences racemelike, sometimes branched; peduncle 5–30 mm; leaf base rounded to cuneate.

- 54a. Leaf blade 2.5–7 cm, apex acute or rounded, rarely subacuminate, blade often leathery ..... 20. *C. formosanum*
- 54b. Leaf blade 6–10 cm, apex long acuminate or caudate, blade membranous ..... 21. *C. kwangsiense*
- 52b. Leaves palmately to pedately 5–7-veined at base, often with enlarged basal lobes.
- 55a. Corona lobes or teeth rounded to triangular, often shorter than corona tube, sometimes obsolete.
- 56a. Corolla lobes ca. 10 mm ..... 16. *C. megalanthum*
- 56b. Corolla lobes up to 5 mm.
- 57a. Corolla glabrous; corona appendages reduced to small teeth or ridges; leaf blade ovate-deltate, oblong-hastate, lanceolate, or linear-lanceolate, less than 1.5 cm wide ..... 18. *C. insulanum*
- 57b. Corolla hairy; corona appendages well developed, fleshy; leaf blade ovate or ovate-lanceolate, 2–4 cm wide.
- 58a. Corona shorter than stigma head, lobes very short, rounded; corolla reflexed ..... 9. *C. decipiens*
- 58b. Corona longer than stigma head, lobes triangular, acute; corolla erect to rotate ..... 8. *C. longipedunculatum*
- 55b. Corona lobes threadlike to acute triangular, as long as or longer than corona tube.
- 59a. Corona lobes longer than corolla; leaves lanceolate or oblong-lanceolate, basal sinus very deep, lobes mostly incurved to overlapping ..... 4. *C. heydei*
- 59b. Corona lobes shorter than corolla; leaves ovate, deltate-ovate, hastate, or hastate-cordate, basal sinus shallow or, if deep, lobes parallel or divergent.
- 60a. Corolla pubescent inside, lobes lanceolate, 1.5–2 mm wide ..... 5. *C. szechuanense*
- 60b. Corolla glabrous inside, lobes oblong or oblong-lanceolate, 1–1.3 mm wide.
- 61a. Corolla erect, purple inside; inner corona appendages included in corona tube; leaf blade hastate or hastate-cordate with enlarged basal lobes, apex long acuminate ..... 6. *C. acutum*
- 61b. Corolla rigidly rotate to slightly reflexed, white; inner corona appendages nearly as long as main corona lobes; leaf blade broadly triangular-cordate; apex acute to short acuminate ..... 7. *C. chinense*

**1. *Cynanchum thesioides*** (Freyn) K. Schumann in Engler & Prantl, Nat. Pflanzenfam. 4(2): 252. 1895.

地梢瓜 di shao gua

*Vincetoxicum thesioides* Freyn, Oestr. Bot. Z. 40: 124. 1890; *Alexitoxicon sibiricum* (Linnaeus) Pobedimova; *Antitoxicum sibiricum* (Linnaeus) Pobedimova; *Asclepias sibirica* Linnaeus; *Cynanchum sibiricum* (Linnaeus) R. Brown (1810), not Willdenow (1799); *C. sibiricum* var. *australe* (Maximowicz) Maximowicz ex Komarov; *C. sibiricum* var. *gracilentum* Nakai & Kitagawa; *C. sibiricum* var. *latifolium* Kitagawa; *Rhodostegiella sibirica* (Linnaeus) C. Y. Wu & D. Z. Li; *R. sibirica* var. *australis* (Maximowicz) C. Y. Wu & D. Z. Li; *Vincetoxicum sibiricum* (Linnaeus) Decaisne; *V. sibiricum* var. *australe* Maximowicz; *V. sibiricum* var. *boreale* Maximowicz.

Herbs suffrutescent, sometimes lianescent, rhizomatous; usually densely puberulent throughout. Stems erect or upper part twining, mainly branched at base. Leaves opposite or subopposite, rarely whorled, sessile or subsessile; leaf blade linear to linear-lanceolate, or occasionally broadly lanceolate, 3–10 × 0.2–1.5(–2.3) cm; midvein elevated abaxially, lateral veins obscure. Inflorescences umbel-like to short racemelike, sometimes terminal; cymules 2-flowered, solitary or clustered; peduncle 1–5(–20) mm. Pedicel 2–10 mm. Sepals lanceolate, 1–2.5 × 0.4–0.8 mm, puberulent, ciliate. Corolla green-white, mostly glabrous but sometimes with some hairs

especially inside tube; tube 1–1.5 mm; lobes 2–3 × 1–1.5 mm, rounded. Corona cupular; tube shorter than anthers, margin 5-lobed; lobes triangular-lanceolate to linear, up to middle of anthers to higher than anther appendages, incurved at base, apex acuminate or rounded. Anther appendages erect, ovate-triangular to lanceolate; pollinia oblong. Stigma head depressed. Follicles ovoid-fusiform, 5–6(–7.5) × 1–2 cm. Seeds ovate, 5–9 × 3–5 mm; coma ca. 2 cm. Fl. Mar-Aug, fr. Aug-Oct.

Open disturbed sites in thickets, dry valleys, sand dunes, grasslands, roadsides; 0–3000 m. Gansu, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang [Kazakhstan, Korea, Mongolia, Russia].

**2. *Cynanchum anthonyanum*** Handel-Mazzetti, Symb. Sin. 7: 997. 1936.

小叶鹅绒藤 xiao ye e rong teng

*Cynanchum yunnanense* Anthony, Notes Roy. Bot. Gard. Edinburgh 15: 240. 1927, not H. Léveillé, 1915.

Stems erect, to 15(–30) cm tall, tomentulose. Leaves opposite; petiole 1–3 mm, hirsute; leaf blade triangular or cordate-oblong, 0.5–1.5 cm × 1–8 mm, glabrous except for midvein, base cordate or rarely truncate, apex subacuminate; lateral veins obscure. Inflorescences umbel-like; peduncle 1.5–2.5 cm. Pedicel 3–4 mm. Sepals lanceolate, ca. 1.5 × 0.5 mm; basal glands 5. Corolla subrotate, glabrous; tube short;

lobes oblong-lanceolate, ca.  $4 \times 1$  mm. Corona cupular, margin with 5 3-toothed lobes, inner appendages linear-triangular, subumbonate, included. Follicles ovate-lanceolate, ca. 4.5 mm, glabrescent. Seeds broadly ovate, ca.  $7 \times 5$  mm; coma ca. 5 mm. Fl. May-Jul, fr. Aug-Sep.

- Thicket edges; 1500–2500 m. Sichuan, Yunnan.

**3. *Cynanchum purpureum*** (Pallas) K. Schumann in Engler & Prantl, Nat. Pflanzenfam. 4(2): 253. 1895.

紫花鹅绒藤 zi hua e rong teng

*Asclepias purpurea* Pallas, Reise Russ. Reich. 3: 260. 1776; *A. davurica* Willdenow; *Cyathella purpurea* (Pallas) C. Y. Wu & D. Z. Li; *Cynanchum roseum* R. Brown; *Cynotonum roseum* (R. Brown) Decaisne; *Vincetoxicum purpureum* (Pallas) Kuntze.

Herbs erect, to 60 cm tall. Rootstock a fleshy taproot to at least 2 cm thick. Stems few branched, hispid, densely so toward base of young stems, hollow when dry. Leaves opposite, usually grouped at branch apex; leaf blade linear or linear-lanceolate, 1–3 cm  $\times$  2–7 mm, sparsely villous, densely ciliate. Inflorescences terminal, umbel-like, often compound, hemispherical, 4–7 cm; peduncle to 5 cm, sparsely villous. Pedicel 5–10 mm, sparsely villous. Sepals lanceolate, 2–4  $\times$  0.7–0.8 mm, pubescent; small basal glands present. Corolla purple, rotate, glabrous; tube ca. 1 mm; lobes linear-lanceolate, 5–10  $\times$  1.5–2 mm. Corona pale, tubular, ca. 2  $\times$  gynostegium, 5–6 mm, membranous, marginal teeth 1–1.5 mm. Pollinia oblong. Stigma head cylindrical. Follicles compressed fusiform, ca.  $7.5 \times 1$  cm, both ends acute. Seeds oblong, ca.  $7 \times 3$  mm, apex irregularly toothed; coma ca. 1.5 cm, tawny. Fl. May-Jun, fr. Jun-Oct.

Montane forests, steppes, sandy ravines. Hebei, Nei Mongol [Korea, Mongolia, Russia].

**4. *Cynanchum heydei*** J. D. Hooker, Fl. Brit. India 4: 25. 1883.

西藏鹅绒藤 xi zang e rong teng

*Vincetoxicum heydei* (J. D. Hooker) Kuntze.

Stems slender, twining, to 1.5 m, sparsely puberulent when young. Petiole 2–3 cm; leaf blade lanceolate to oblong-lanceolate, ca.  $5.5 \times 2$ –2.6 cm, slightly fleshy, sparsely puberulent when young, base very deeply cordate, basal lobes incurved and overlapping, apex acute; basal veins 3–5, lateral veins 5–6 pairs. Inflorescences short racemelike, to 3.5 cm, to 9-flowered; peduncle to 1.6 cm. Pedicel 5–8 mm. Sepals ca.  $2 \times 0.8$  mm, slightly puberulent. Corolla lobes oblong-lanceolate,  $\pm$  erect, ca.  $4.5 \times 1.8$  mm, glabrous, apex rounded. Corona cylindrical, ca. 1.5 mm, margin produced into 5 linear lobes longer than corolla, interior with 5 short, ligulate appendages, sinus smooth. Stigma head apiculate at apex.

Forests. W Xizang [Kashmir, Pakistan].

**5. *Cynanchum szechuanense*** Tsiang & Zhang in Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 86. 1974.

四川鹅绒藤 si chuan e rong teng

as long as corolla lobes, apex unequally forked. Anthers broadly rhomboid, appendages oblong. Stigma head  
*Cynanchum szechuanense* var. *albescens* Tsiang & Zhang.

Plants pubescent or pilose except for corolla. Stems twining, to 6 m, pubescent along 1 side. Petiole 1.5–5.5 cm; leaf blade ovate or triangular-ovate, 3.2–13(–23)  $\times$  1.5–8.5 (–13.5) cm, papery, adaxially minutely appressed puberulent, abaxially pubescent on veins, base deeply cordate with basal lobes sometimes incurved and rarely slightly enlarged, apex acuminate; basal veins 5–7, pedate, lateral veins 2 or 3 pairs. Inflorescences long, simple or with short lateral branches; cymules distinct, many flowered, umbel-like or  $\pm$  contiguous, few flowered, and racemelike; peduncle 4–8(–12.5) cm, rachis 0–7 cm. Sepals lanceolate, ca.  $3.5 \times 1$  mm; basal glands present. Corolla green or white with purple apex, rotate to reflexed, tube short; lobes lanceolate,  $3.5$ – $5.5$ (– $6.7$ )  $\times$  1.4–2 mm, glabrous outside, pubescent inside. Corona white, tube cupular, 1.3–2.5 mm high, membranous, margin with 5 main lobes, these triangular to threadlike, 1.2–3 mm, sinuses between these each usually with ca. 3 small rounded teeth, sometimes  $\pm$  truncate; inner appendages lanceolate to threadlike, as long as or exerted from tube. Anther appendages rounded; pollinia oblong. Stigma head conical. Follicles lanceolate in outline,  $7.5$ – $9 \times$  ca. 1.5 cm. Fl. May-Jul.

- Open woodland, climbing over shrubs; 2300–3200 m. W Sichuan, Xizang.

*Cynanchum szechuanense* is quite variable in the length of corona lobes. Forms with the longest lobes are restricted to W Sichuan but those with short triangular lobes are found throughout the species range. Further studies are needed to show if infraspecific taxa can be recognized.

**6. *Cynanchum acutum*** Linnaeus subsp. *sibiricum* (Willdenow) K. H. Rechinger, Fl. Iranica 73: 9. 1970.

戟叶鹅绒藤 ji ye e rong teng

*Cynanchum sibiricum* Willdenow, Ges. Naturf. Freunde Berlin Neue Schriften 124. 1799; *Cyathella cathayensis* (Tsiang & Zhang) C. Y. Wu & D. Z. Li; *Cynanchum acutum* var. *longifolium* (Martens) Ledebour; *C. cathayense* Tsiang & Zhang; *C. longifolium* Martens.

Roots ca. 2 cm in diam. Stems many branched and woody at base, twining to 3 m, villous to puberulent, sometimes glabrous. Petiole 0.5–4 cm; leaf blade hastate, hastate-cordate, or oblong-hastate,  $1.3$ – $6$ (– $15$ )  $\times$   $1.1$ – $4.5$ (– $8$ ) cm, papery, base auriculate, apex acute to long acuminate, basal lobes recurved, parallel or divergent, ciliate, glabrous or densely pubescent along veins; basal veins 5–7, lateral veins ca. 3 pairs. Inflorescences racemelike; peduncle 0.5–5 cm, rachis to 7 cm. Pedicel 4–8 mm. Sepals ovate,  $1.5$ – $2 \times 0.5$ – $0.9$  mm, puberulent outside, glandular inside. Corolla white outside, white to purple inside; tube ca. 1 mm; lobes narrowly ovate or oblong, ca.  $4 \times 1.3$ – $2$  mm, obtuse, glabrous. Corona cylindrical, margin 5-lobed; lobes 3-fid with middle segment long threadlike, interior with 5 short appendages included

within tube. Anthers nearly square, appendages ovate; pollinia to linear, 6.5–13 cm × 8–10 mm, puberulent. Seeds oblong-ovate, 5–7.5 × 2–2.5 mm; coma 2–3 cm. Fl. May–Aug, fr. Jun–Oct.

Dry areas, waste places; 900–1400 m. Gansu, Hebei, Nei Mongol, Ningxia, Xinjiang, Xizang [Afghanistan, Kashmir, Kazakhstan, Mongolia, Pakistan, Russia, Turkmenistan; SW Asia].

The plant is used medicinally to treat swellings.

*Cynanchum acutum* subsp. *acutum* is widespread in the Mediterranean region from Spain east to Iraq, where there is a small area of overlap with subsp. *sibiricum*. It differs by having ovate leaves with convex sides.

**7. *Cynanchum chinense*** R. Brown, Mem. Wern. Nat. Hist. Soc. 1: 44. 1810.

鹅绒藤 e rong teng

*Cynanchum deltoideum* Hance; *C. pubescens* Bunge; *Vincetoxicum pubescens* (Bunge) Kuntze.

Plants twining to 4 m, pubescent throughout. Leaves opposite; petiole 1–4 cm; leaf blade broadly triangular-cordate, 2.5–9 × 2–7 cm, thin papery, glaucous abaxially, base cordate, apex acute; basal veins up to 9, lateral veins up to 6 pairs, slightly elevated abaxially. Inflorescences normally forked at first flower, sometimes rebranching, to ca. 20-flowered; peduncle to 6 cm; rachis to 10 cm, often branched, zigzag in fruit. Pedicel ca. 1 cm. Sepals oblong-triangular, 1–2 × 0.5–1 mm, ciliate, pubescent. Corolla white, rotate to reflexed, glabrous; tube 0.5–1 mm; lobes oblong-lanceolate, 3–6 × 1–1.2 mm. Corona tube cupular, ca. 1 mm, as long as gynostegium, margin with 5 threadlike lobes as long as corolla lobes alternating with 5 short rounded lobes, interior with 5 shorter, threadlike appendages. Anthers sub-rhomboid, appendages rounded; pollinia oblong. Stigma head convex. Follicles cylindrical-fusiform, 8–13 cm × 5–8 mm, apex acuminate. Seeds oblong, 5–6 × ca. 2 mm; coma 2.5–3 cm. Fl. Jun–Aug, fr. Aug–Oct.

Thickets, roadsides, river banks; below 500(–900) m. Gansu, Hebei, Henan, Jiangsu, Jilin, Liaoning, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Korea, Mongolia].

A decoction of all parts is used for the treatment of colds and chills.

**8. *Cynanchum longipedunculatum*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, Novon 5: 7. 1995.

短柱豹药藤 duan zhu bao yao teng

Stems twining, internodes puberulent along 1 side. Petiole ca. 2.5 cm, slender; leaf blade lanceolate, ca. 5.6 × 2.3 cm, adaxially puberulent, abaxially hairy along veins, base deeply cordate, lobes often overlapping, apex long acuminate; basal veins usually 7, lateral veins 3 or 4 pairs. Inflorescences umbel-like, dense, to 2 cm wide; peduncle 6–9 cm, densely hairy on 1 side, sometimes an isolated flower below main inflorescence. Pedicel 3.5–6 mm, puberulent on 1 side. Sepals oblong lanceolate, ca. 2 × 0.9 mm, puberulent. Corolla white, glabrous outside, densely pilose inside, tube ca. 0.5 mm; lobes

Stems twining to 2 m, terete, internodes with 2 lines

oblong. Stigma head subapiculate. Follicles lanceolate ca. 5.5 × 1.7 mm, ± erect. Corona cupular, longer than stigma head, slightly fleshy, tube longer than triangular marginal lobes, interior with 5 internal appendages nearly as long as marginal lobes. Anther appendages ovate. Stigma head rounded.

• 3600 m. Western China (Sichuan or Hubei).

Known only from the type, which lacks detailed locality data.

**9. *Cynanchum decipiens*** C. K. Schneider in Sargent, Pl. Wilson. 3: 345. 1916.

豹药藤 bao yao teng

Plants twining to 3 m. Branchlets gray-brown, terete, pubescent along 1 line, sometimes subglabrous. Leaves opposite; petiole 1–3 cm, sparsely puberulent, with a group of adaxial glands; leaf blade ovate or ovate-lanceolate, 5–8 × 2–4 cm, membranous, sparsely puberulent, base cordate, apex acuminate. Inflorescences umbel-like, 3–15 cm, to 25-flowered, puberulent; peduncle 4–10 cm; basal bracts linear-lanceolate, to 1.8 cm. Pedicel 1–2 cm. Sepals lanceolate, ca. 2 mm, sparsely pilose, ciliate. Corolla white or reddish, rotate; lobes oblong, ca. 4 mm, glabrous outside, whitish puberulent inside. Corona cupular, shorter than gynostegium, somewhat fleshy, margin very shallowly 5-lobed, interior with 5 ovate, fleshy appendages. Anther appendages rounded, incurved; pollinia oblong. Follicles lanceolate, ca. 11 × 1.2 cm. Seeds oblong-spatulate; coma ca. 2 cm. Fl. May–Jul, fr. Jul–Oct.

• Open woodland, thickets along valleys and roadsides; 2000–3500 m. Guizhou, Hunan, Sichuan, Yunnan.

**10. *Cynanchum brevicoronatum*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, Novon 5: 5. 1995.

短冠豹药藤 duan guan bao yao teng

Stems twining, puberulent along 2 lines. Petiole to ca. 3 cm, adaxially puberulent; leaf blade ovate or ovate-triangular, 6–7.5 × 3–4.2 cm, adaxially sparsely minute hairy, abaxially pale gray-green and puberulent along veins, base cordate with wide sinus, basal lobes incurved, apex acute to subacuminate; basal veins 3(–5), lateral veins 2 or 3 pairs. Inflorescences simple, densely racemelike, to 1.5 cm; cymules 2-flowered; peduncle 1–5 mm, puberulent. Pedicel to 5.5 mm, pubescent. Sepals lanceolate, ca. 1.5 × 0.7 mm, ciliate, minutely puberulent, strongly reflexed at anthesis. Corolla erect; lobes oblong-ovate, ca. 3.5 × 1.7 mm, slightly fleshy, glabrous. Corona a shallow membranous cup ca. as high as gynostegium, internal appendages absent. Gynostegium ca. 2.5 mm high; anther appendages ovate, acute. Follicles often solitary, lanceolate in outline, ca. 6 × 1.5 cm.

• Hubei.

**11. *Cynanchum wallichii*** Wight, Contr. Bot. India 56. 1834.

昆明杯冠藤 kun ming bei guan teng

*Cyathella wallichii* (Wight) C. Y. Wu & D. Z. Li; *Cynotonum wallichii* (Wight) Decaisne; *Vincetoxicum wallichii* (Wight) Kuntze.

of hairs. Petiole 2.5–4 cm; leaf blade ovate-oblong, 4–9 × 2–4

cm, thin papery, adaxially pubescent, densely so along veins, abaxially glabrescent and glaucous, ciliate, base deeply cordate with rounded and incurved lobes, apex short acuminate; basal veins 5, lateral veins 3 or 4 pairs; stipulelike axillary leaves present. Inflorescences subsessile, racemelike, to 3.5 cm, 10–20-flowered; cymules 2-flowered, in regular spiral; peduncle to 2 cm, often shorter than pedicels. Pedicel to 1.5 cm. Sepals ovate, ca. 1.5 mm, pubescent; basal glands up to 20. Corolla white or yellow-white, usually reflexed to rotate, glabrous; lobes oblong-lanceolate, ca. 5 × 1.7 mm. Corona white, cupular, membranous, 3.3–4 mm high, margin with 5 rounded teeth, plicate inside between teeth, these often well developed and appendagelike. Pollinia oblong. Fl. Sep.

Yunnan (Kiukiang Valley) [Bangladesh, Myanmar].

Most Chinese material formerly included in *Cynanchum wallichii* belongs to *C. kintungense* Tsiang.

**12. *Cynanchum duclouxii*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, *Novon* 5: 6. 1995.

小花杯冠藤 xiao hua bei guan teng

Stems twining, puberulent along 1 line. Petiole 2.5–3.2 cm; leaf blade abaxially slightly paler but apparently not glaucous, triangular-ovate, 4.5–8 × 1.7–5.1 cm, abaxially glabrous except for puberulent veins, adaxially uniformly minute puberulent, base deeply cordate, basal lobes slightly enlarged, sometimes overlapping, apex acute to subacuminate; basal veins 3–5, pedate, lateral veins 2 or 3 pairs. Inflorescences racemelike, sometimes terminal on short axillary branches; peduncle 0.7–5.5 cm; rachis to 1.5 cm; cymules 2-flowered, in lax spiral. Pedicel to 6 mm, puberulent. Sepals ovate, ca. 1 × 0.8 mm, sparsely puberulent, apex acute. Corolla white, erect, deeply divided; lobes 2.5–3 × 1–1.4 mm, glabrous. Corona membranous, prominently 5-lobed; tube ca. as high as middle of anthers; lobes longer than anther appendages, often inflexed, each with 2 prominent adaxial ridges at base, rarely with a small adaxial appendage. Anther appendages ovate, acute, prominent. Follicles solitary, lanceolate in outline, ca. 6.5 cm × 9 mm, base tapered, apex subacuminate.

• Bushland in valleys. Yunnan.

**13. *Cynanchum sinoracemosum*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, *Novon* 5: 8. 1995.

尖叶杯冠藤 jian ye bei guan teng

Stems twining, terete, internodes puberulent along 1 or 2 sides. Petiole 1.4–3.5 cm, slender, puberulent along adaxial groove; leaf blade lanceolate, 4.3–6(–8) × 1.5–2.5(–4.5) cm, adaxially sparsely pubescent, abaxially paler and more sparsely hairy, sometimes glabrous except for veins, base deeply cordate, basal lobes incurved and sometimes overlapping, apex long acute to subacuminate; basal veins 5–7, lateral veins 3 or 4 pairs; minute stipulelike axillary leaves present. Inflorescences racemelike, 2–4 cm; cymules 2-flowered, in regular spiral; peduncle 0.4–2.5 cm, puberulent. Pedicel 3–7 mm. Sepals ca. 1.3 × 0.7 mm, puberulent. Corolla white, erect, glabrous; lobes oblong-lanceolate, 3.3–4.5 × 1.3–adaxial appendages between acute teeth, marginal teeth 10, alternately rounded and acute, ca. 0.5–0.7 mm. Anther appen-

1.5 mm. Corona white, deeply cupular, ca. 2–3 mm high, concealing gynostegium, plicate, marginal lobes 5, bluntly triangular, up to 0.4 mm, alternating with well-defined, appendagelike plicae. Young fruit relatively broad, solitary. Fl. Jun-Aug.

• Hedges. Sichuan, Yunnan.

**14. *Cynanchum kintungense*** Tsiang, *Sunyatsenia* 4: 110. 1939.

景东杯冠藤 jing dong bei guan teng

Stems twining to 2 m, terete, pubescent along 1 side. Leaves opposite; petiole 2.5–4 cm; leaf blade ovate-oblong, 4–9 × 2–4 cm, thin papery, adaxially pubescent, densely so along veins, abaxially glabrescent and glaucous, ciliate, base auriculate-cordate, basal lobes rounded, incurved, apex short acuminate; basal veins 5, lateral veins 3 or 4 pairs; stipulelike axillary leaves present. Inflorescences corymbose, 10–20-flowered. Sepals ovate, ca. 1.5 mm, pubescent; basal glands up to 20. Corolla white or yellow-white, glabrous; lobes oblong-lanceolate, ca. 3.5 × 1.5 mm, rotate. Corona white, cupular, membranous, ca. 2 mm high, margin with 5 rounded teeth, plicate inside between teeth. Pollinia oblong. Follicles subfusiform, ca. 6.5 × 1 cm, glabrous, apex beaked, acuminate. Seeds broadly ovate, ca. 8 × 5 mm; coma 1–2 cm. Fl. Jul-Oct, fr. Sep-Dec.

• Thickets, roadsides, along valleys. Guangxi, Guizhou, Sichuan, Xizang, Yunnan.

Nearly all the Chinese material formerly included in *Cynanchum wallichii* belongs here. The species differs from *C. wallichii* by the shorter corona tube and rotate corolla. The illustration in the protologue shows the corolla as reflexed but no material with clearly reflexed corollas has been seen, and the illustration may be based on a faulty reconstruction of the rather shrivelled type collection.

**15. *Cynanchum corymbosum*** Wight, *Contr. Bot. India* 56. 1834.

刺瓜 ci gua

*Cyathella corymbosa* (Wight) C. Y. Wu & D. Z. Li;  
*Cynoctonum corymbosum* (Wight) Decaisne.

Root tubers strong. Stems twining, to 2 m, pale gray, pubescent along 2 lines. Petiole 2.5–4.5 cm; leaf blade abaxially glaucous, adaxially darkening on drying, ovate or ovate-oblong, 4.5–12(–20) × 3.5–8(–10) cm, thin papery, base cordate, basal lobes rounded, apex apiculate or acuminate, glabrous except for veins, basal veins 5, lateral veins ca. 3 pairs. Inflorescences racemelike, 2.5–7 cm, less often laxly branched and to 13 cm; cymules 2-flowered; peduncle 1–5 cm, puberulent. Pedicel 0.2–1.8 cm, pubescent. Sepals ovate, 1.5–2 × ca. 1 mm, glabrous or pubescent; basal glands 5, minute. Corolla greenish white drying dark, subrotate; lobes oblong-lanceolate, ca. 5 × 1.5 mm, glabrous. Corona ± tubular, pure white, 3–4 mm high, plicate and with ± free

dages oval; pollinia oblong. Stigma head bifid, included within anthers. Follicles fusiform, 9–12 × 2–3 cm, conspicuously

echinate, spines curved at tip. Seeds brown, 7–10 × ca. 5 mm, conspicuously dentate at end opposite coma; coma 3–4 cm. Fl. May–Oct, fr. Aug–Dec.

Thickets, open woods, riversides, valleys. Fujian, Guangdong, Guangxi, Hunan, Sichuan, Yunnan [Cambodia, India, Laos, ?Malaysia, Myanmar, Vietnam].

All parts are used as medicine to induce lactation and to treat nephritis, neurasthenia, and pulmonary tuberculosis.

**16. *Cynanchum megalanthum*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, *Novon* 5: 7. 1995.

大花刺瓜 da hua ci gua

Twiners robust. Stems puberulent along 1 (or 2) lines. Leaves opposite; petiole ca. 2.5 cm; leaf blade abaxially gray-green, triangular-ovate, to 8.5 × 4.8 cm, thin papery, minutely puberulent, base deeply cordate, basal lobes rounded, not incurved, apex acute to acuminate; basal veins 5, lateral veins ca. 3 pairs. Inflorescences umbel-like or sometimes raceme-like with many-flowered cymules; peduncle robust, ca. 5 cm, thin puberulent. Pedicel 1–1.4 cm, puberulent along 1 side. Sepals lanceolate, ca. 5 × 1.4 mm, very sparsely and minutely puberulent. Corolla cream or pale greenish pink, deeply divided, rotate; lobes linear-lanceolate, ca. 10 × 2.2 mm, very sparsely hairy. Corona cupular, ca. 1 mm high, with 5 triangular marginal lobes to 3 mm high and small internal appendages. Anther appendages oval, incurved over stigma head. Fruit and seeds not seen.

Probably along thicket margins; 3300 m. Yunnan [Myanmar].

**17. *Cynanchum kingdonwardii*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, *Novon* 5: 6. 1995.

宁蒭杯冠藤 ning lang bei guan teng

Stems twining, internodes with 2 poorly defined lines of hairs. Leaves opposite; petiole to 1.1 cm; leaf blade linear-lanceolate, to more than 11 × 1.2 cm, adaxially thin puberulent, abaxially glabrous, base cuneate, apex acute; lateral veins ca. 10 pairs. Inflorescences umbel-like; peduncle to 3 mm, pubescent along 1 side. Pedicel to 7 mm, puberulent. Sepals lanceolate, ca. 2 × 0.8 mm, sparsely hairy. Corolla very pale green, deeply divided, glabrous; lobes oblong-lanceolate, ca. 5 × 2.4 mm, blunt. Corona white, cupular, ca. 2.5 mm high, membranous, adnate to anthers, margin with 5 low, acute teeth, smooth inside. Gynostegium slightly higher than corona; anther appendages narrowly ovate. Fl. Jun–Jul.

• Yunnan (Yung-ning).

**18. *Cynanchum insulanum*** (Hance) Hemsley, *J. Linn. Soc., Bot.* 26: 107. 1889.

海南杯冠藤 hai nan bei guan teng

Herbs, glabrous except for pubescent nodes, petioles, and leaf margin. Rhizome nodes sometimes forming globose Hamilton ex Wight) Decaisne; *Vincetoxicum callialatum* (Buchanan-Hamilton ex Wight) Kuntze.

tubers. Stems twining, to 60 cm. Leaves opposite; petiole 1–15 mm; leaf blade oblong-hastate, ovate-triangular, to linear-lanceolate, 1–4 × 0.1–1.5 cm, base rounded to subcordate-hastate, apex acute or short apiculate; lateral veins 5 or 6 pairs. Inflorescences umbel-like, much shorter than leaves, 4- or 5-flowered. Sepals oblong, ca. 1 × 0.5 mm, acute; basal glands 5. Corolla greenish white, subrotate; tube ca. 0.5 mm; lobes ovate-oblong, ca. 2 × 1 mm, acute. Corona tube cupular, thin membranous, ca. 2 mm, longer than gynostegium, longitudinally plicate; anthers nearly square, appendages ovate; pollinia oblong. Stigma head capitate, included within anthers. Follicles lanceolate, 4.5–5 cm × 7–8 mm, with 2 inconspicuous longitudinal ridges, glabrous. Seeds oblong, ca. 3 mm; coma ca. 2 cm.

• Two varieties: 0–100 m. Guangdong, Guangxi, Hainan.

- 1a. Leaf blade 5–15 mm wide, base truncate or subcordate-hastate; corona shallowly 10-lobed ..... 18a. var. *insulanum*
- 1b. Leaf blade 1–3 mm wide, base rounded; corona deeply 10-lobed ..... 18b. var. *lineare*

**18a. *Cynanchum insulanum* var. *insulanum***

海南杯冠藤(原变种) hai nan bei guan teng (yuan bian zhong)

*Cynoctonum insulanum* Hance, *J. Bot.* 6: 330. 1868; *Cyathella insulana* (Hance) Tsiang & Zhang; *Vincetoxicum insulanum* (Hance) Kuntze.

Leaves ovate-triangular, oblong-hastate, or lanceolate, 2–3.5 × 0.5–1.5 cm, base truncate or subcordate-hastate. Corona shallowly 10-lobed, lobes obtuse. Fl. May–Oct, fr. Oct–Dec.

• Open woodland, sandy seashores; 0–100 m. Guangdong, Guangxi, Hainan.

**18b. *Cynanchum insulanum* var. *lineare*** (Tsiang & Zhang) Tsiang & Zhang, *Acta Phytotax. Sin.* 12: 109. 1974.

线叶杯冠藤 xian ye bei guan teng

*Cyathella insulana* (Hance) Hemsley var. *lineare* Tsiang & Zhang, *Acta Phytotax. Sin.* 10: 39. 1965.

Leaves linear or linear-lanceolate, 1–4 cm × 1–3 mm, base rounded. Corona deeply 10-lobed, lobes acuminate. Fl. Jun–Sep.

• Seaside grasslands. S Guangdong, Hainan.

**19. *Cynanchum callialatum*** Buchanan-Hamilton ex Wight, *Contr. Bot. India* 56. 1834.

美翼杯冠藤 mei yi bei guan teng

*Cyathella callialata* (Buchanan-Hamilton ex Wight) C. Y. Wu & D. Z. Li; *Cynoctonum callialatum* (Buchanan-

Herbs twining, to 3 m. Stems pubescent along 1 side. Leaves opposite; petiole 1–4 cm; leaf blade abaxially glau-



cous, oblong or ovate-oblong, 4.5–8 × 2–4 cm, slightly fleshy, base cordate, apex acuminate, basal lobes incurved, sometimes overlapping; lateral veins 6–12 pairs. Inflorescences simple, umbel-like, dense, 6–12-flowered; peduncle 1–7 mm. Pedicel 3–6 mm. Sepals lanceolate, 2–2.5 × 1 mm; basal glands ca. 10. Corolla whitish, drying darker than corona, rotate; tube ca. 1 mm; lobes oblong, ca. 4 × 1.5–2 mm. Corona white, cupular, ca. 3.5 mm, or reduced to membranous ring, apex 2-cleft, with a longitudinal ridge below each sinus. Gynostegium distinctly stipitate. Anthers ± rhomboid, ca. 1 mm, appendages oval; pollinia oblong. Stigma head ovoid, slightly exserted. Follicles oblong-lanceolate, 5–8 × 1–1.5 cm, with 2 wings especially prominent at tip. Seeds oval-oblong, ca. 5 × 3 mm; coma ca. 2 cm. Fl. Aug–Oct, fr. Oct–Dec.

Open woodland, thickets along mountain roadsides; 1000–1500 m. W Guangxi, Yunnan [India, Myanmar, Pakistan].

Records of *Cynanchum alatum* Wight & Arnott in China are based on a misidentification of *C. callialatum*. *Cynanchum alatum* appears to be restricted to India and Sri Lanka.

**20. *Cynanchum formosanum*** (Maximowicz) Hemsley, J. Linn. Soc., Bot. 26: 106. 1889.

台湾杯冠藤 tai wan bei guan teng

*Cynoctonum formosanum* Maximowicz, Bull. Acad. Sci. Saint-Petersbourg 23: 370. 1877; *Cyathella formosana* (Maximowicz) C. Y. Wu & D. Z. Li; *C. formosana* var. *ovalifolia* (Tsiang & P. T. Li) C. Y. Wu & D. Z. Li; *Cynanchum crassifolium* Hatusima (1963), not R. Brown (1810); *C. formosanum* var. *ovalifolium* Tsiang & P. T. Li; *C. hatusimai* P. T. Li; *Vincetoxicum formosanum* (Maximowicz) Kuntze.

Stems twining, to 3 m, glabrous or sparsely pubescent. Petiole 1–4 cm; leaf blade oblong to elliptic, 2.5–7 × 1.5–5 cm, leathery or thick papery, glabrous, base rounded or cordate, apex acute or rounded-cuspidate, sometimes sub-acuminate; lateral veins 4–6 pairs. Inflorescences racemelike, often branched, 10–35-flowered, 2.5–3.5 cm; cymules 2-flowered; peduncle 0.5–3 cm, pubescent or glabrous. Pedicel to 5 mm. Sepals ovate-oblong, ca. 5 × 2 mm, ciliate; basal glands 5. Corolla ca. 1 cm in diam., rotate to reflexed, fleshy, glabrous; lobes oblong, 4–5 mm, apex acute. Corona cupular, longer than gynostegium, plicate, margin with 5 long teeth alternating with 5 short-truncate, denticulate lobes. Anther appendages rounded to reniform, mucronate; pollinia broadly ovoid. Stigma head slightly elevated. Follicles lanceolate, 7–9 × 1–1.5 cm, glabrous. Seeds flattened, ovate, ca. 1.5 cm; coma to 4 cm. Fl. May–Oct.

• Forests, thickets; low to medium altitudes. Taiwan (Taibei and Taizhong, Lanyu and Lutao Islands).

**21. *Cynanchum kwangsiense*** Tsiang & Zhang in Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 109. 1974.

**23. *Cynanchum otophyllum*** C. K. Schneider in Sargent, Pl. Wilson. 3: 347. 1916.

广西杯冠藤 guang xi bei guan teng

*Cyathella kwangsiensis* (Tsiang & Zhang) C. Y. Wu & D. Z. Li.

Stems twining to 3 m, pilose, glabrescent. Leaves opposite; petiole ca. 1.5 cm; leaf blade elliptic, 6–10 × 2.5–4 cm, leathery, glabrous, base cuneate or rounded, apex acuminate or caudate; lateral veins 5–9 pairs. Inflorescences racemelike, 2–3 cm, 5–10-flowered; peduncle 1–2 cm, puberulent. Pedicel ca. 5 mm, puberulent. Sepals ovate, ca. 1.5 × 0.8 mm, ciliate, puberulent. Corolla white, glabrous; lobes oblong-ovate, ca. 3.2 × 1.7 mm, apex acute or obtuse. Corona cupular, longer than gynostegium, plicate, margin with 10 teeth alternating with pairs of minute, rounded teeth. Anther appendages ovate, apiculate; pollinia elliptic. Stigma head raised. Fl. May–Oct.

• Open woodland; 550–600 m. Guangxi (Tianlin and Luocheng).

*Cynanchum kwangsiensis* is very closely related to *C. formosanum*, differing only in quantitative leaf characters.

**22. *Cynanchum wilfordii*** (Maximowicz) J. D. Hooker, Fl. Brit. India 4: 25. 1883.

隔山消 ge shan xiao

*Cynoctonum wilfordii* Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 9: 799. 1876; *Seutera wilfordii* (Maximowicz) Pobedimova; *Vincetoxicum wilfordii* (Maximowicz) Franchet & Savatier.

Roots fleshy, irregularly fusiform, up to 10 × 2 cm. Stems twining, to 2 m, pubescent along 1 line. Leaves opposite; petiole 2 cm, with adaxial glands; leaf blade ovate or ovate-cordate, 5–6 × 2–4 cm, thin papery, appressed puberulent, adaxially dark when dry, base auriculate-cordate, basal lobes rounded, recurved or incurved, apex short cuspidate to acuminate; basal veins 3–5, lateral veins ca. 4 pairs. Inflorescences umbel-like to very short racemelike, hemispherical, densely 15–20-flowered; peduncle ca. 1.5 cm, rarely dichotomous, puberulent along 1 side. Pedicel 5–7 mm, puberulent. Sepals oblong-lanceolate, ca. 1.5 × 0.6 mm, glabrous or sparsely pubescent; basal glands 10. Corolla yellowish, rotate; lobes lanceolate, 4.5–5 × ca. 2 mm, glabrous outside, densely short pilose inside. Corona deeply 5-lobed; lobes rounded to nearly square, membranous, shorter than gynostegium, base attenuate, apex truncate, with transverse adaxial ridge. Gynostegium stipitate. Anther appendages ovate, almost as long as corona; pollinia oblong. Stigma head umbonate. Follicles lanceolate, 11–12 × 1–1.4 cm. Seeds ovate, ca. 7 mm; coma ca. 2 cm. Fl. May–Sep, fr. Jul–Nov.

Thickets, valleys, mountain slopes, roadsides, grasslands; 800–1500 m. Anhui, Gansu, Henan, Hubei, Hunan, Jiangsu, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan [Japan, Korea, Russia].

The root is used as medicine for impotency, neurasthenia, and lumbago.

青羊参 qing yang shen

*Cyathella otophylla* (C. K. Schneider) C. Y. Wu & D. Z.

Li.

Stems twining, to 2 m, pubescent along 1 line. Leaves opposite; petiole 1.5–5 cm, adaxially puberulent; leaf blade ovate-lanceolate, 4–11 × 2.5–8 cm, abaxially distinctly paler, membranous, minutely pilose, sometimes glabrescent, base strongly auriculate, basal lobes rounded, apex gradually acuminate. Inflorescences umbel-like or racemelike; peduncle 2–4 cm, puberulent to subglabrous; cymules up to 8-flowered. Pedicel 3–5 mm, puberulent on 1 side. Sepals ovate-lanceolate, ca. 1 × 0.7 mm, puberulent; basal glands 5. Corolla white, rotate; lobes oblong, 2–3 × ca. 1 mm, minutely puberulent inside. Corona slightly shorter than corolla, deeply 5-lobed; lobes oblong-lanceolate, narrower toward base, apex rounded to subacute, sometimes slightly 3-toothed, slightly fleshy, adaxially grooved with lateral longitudinal ridges, adaxial appendages minute or absent. Gynostegium short stipitate. Anther appendages ovate, erect; pollinia oblong. Stigma head slightly convex. Follicles lanceolate, 8–9 × ca. 1 cm, with 2 ridges or angles. Seeds ovate, ca. 6 × 3 mm; coma ca. 3 cm. Fl. Jun–Oct, fr. Aug–Dec.

• Thickets, open woods; 1000–3000 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan, Xizang, Yunnan.

The roots are used as medicine for rheumatism, epilepsy, hydrophobia, and detoxification of viper bites.

*Cynanchum otophyllum* previously included *C. triangulare* M. G. Gilbert & W. D. Stevens (*C. deltoideum* J. D. Hooker, not Hance) from northwestern India but that species, though very similar vegetatively, has a distinctly tubular corona, leaving *C. otophyllum* as a Chinese endemic.

**24. *Cynanchum giraldii*** Schlechter, Bot. Jahrb. Syst. 36: Beibl. 82: 92. 1905.

峨眉牛皮消 e mei niu pi xiao

Herbs; most parts puberulent. Stems twining to 4 m, slender. Leaves opposite, usually with small, axillary, stipulelike leaves; petiole 2–3 cm, slender; leaf blade hastate-oblong, 7–14 × 3–6 cm, thin papery, base auriculate-cordate, apex acuminate; lateral veins ca. 10 pairs. Inflorescences umbel-like, 5–10-flowered; peduncle and pedicel 1–2 cm, glabrescent. Sepals ovate-triangular, usually glabrescent, sparsely ciliate. Corolla red or reddish, subturate; lobes oblong, 3–4 mm, apex obtuse, glabrous. Corona deeply 5-lobed, pubescent; lobes ovate or broadly ovate, apex obtuse, shorter than gynostegium, with a ligulate, adaxial appendage. Anthers subrhomboid, base dilated, appendages ovate, obtuse, incurved over stigma head; pollinia oblong; stigma head slender. Follicles fusiform, acuminate at both ends, 8–10 × ca. 1 cm, glabrous. Seeds ovate, ca. 7 × 3 mm, apex truncate; coma ca. 3 cm. Fl. Jul–Aug, fr. Aug–Oct.

• Thickets, open woods, grasslands. Gansu, Henan, Shaanxi, Sichuan.

**25. *Cynanchum batangense*** P. T. Li, Acta Bot. Yunnan. 12: 19. 1990.

巴塘白前 ba tang bai qian

glabrous; basal glands present, few. Corolla white or yellowish green, rotate; tube ca. 1 mm; lobes oblong, ca. 4 × 2.5 mm, acute, strongly reflexed, minutely puberulent adaxially

Herbs perennial climbers to 3 m. Stems, leaves, petioles, and pedicels puberulent. Petiole 1.5–3 cm, with adaxial glands; leaf blade ovate, ovate-triangular, or oblong-lanceolate, 5–8.5 × 3–5 cm, papery, base cordate with rounded enlarged lobes, apex short acuminate; lateral veins 6 or 7 pairs. Inflorescences 1.3–2.1 cm; peduncle 1–2(–6) mm. Pedicel 0.8–1.5 cm. Sepals ovate-oblong, 4–4.5 × 1–1.5 mm, glabrous, ciliate; basal glands 10. Corolla purple, rotate, membranous, ca. 1.7 cm in diam.; tube ca. 1 mm; lobes oblong, 5–8.5 × 2.5–3.5 mm, glabrous outside, puberulent inside, apex obtuse. Corona deeply 5-lobed; lobes oblong, 5–5.5 × 1.5–2 mm, longer than gynostegium, base ± fleshy, apical part membranous, retuse, with a fleshy adaxial, ligulate appendage. Anther appendages broadly ovate; pollinia oblong. Stigma head discoid, apex conical. Fl. Aug.

• Thickets. Sichuan.

**26. *Cynanchum lysimachioides*** Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 89. 1974.

白牛皮消 bai niu pi xiao

*Cynanchum likiangense* W.T. Wang ex Tsiang & P.T. Li.

Herbs, erect or twining to 4 m, pilose throughout. Rootstock fleshy. Leaves opposite; petiole 2–4 cm; leaf blade triangular to circular, 4–10 × 2.5–8.5 cm, base shallowly cordate, margin subundulate, apex rounded-cuspidate to acute; basal veins 3–5, lateral veins (2 or) 3–6 pairs. Inflorescences umbel-like, 5–8-flowered; peduncle 2–3 cm. Pedicel 2–3 cm. Sepals lanceolate or narrowly triangular, (2–)3.5–5 × 1–1.5 mm, minutely hirsute; basal glands 5. Corolla white, rotate to reflexed; lobes oblong, 5–10 × 2.5–4 mm, puberulent. Corona deeply 5-lobed; lobes ovate-oblong, ca. 5 mm, apex subobtuse and longer than gynostegium, with rounded, adaxial appendages incumbent on anther. Pollinia oblong. Fl. Aug.

• Forest edges and thickets. Yunnan (Lijiang).

**27. *Cynanchum bungei*** Decaisne in A. de Candolle, Prodr. 8: 549. 1844.

白首乌 bai shou wu

*Asclepias hastata* Bunge, Enum. Pl. China Bor. 43, n. 146. 1833 (1831), not *Cynanchum hastatum* Lamarck (1786); *Symphoglossum hastatum* (Bunge) Turczaninow; *Vincetoxicum hastatum* (Bunge) Kuntze.

Root tubers 3–7 × 1.5–4 cm. Stems twining, to 4 m, slender, puberulent. Leaves opposite; petiole 1–1.5 cm; leaf blade hastate or narrowly ovate-triangular, 3–8 × 1–5 cm, membranous, hispid, base cordate, basal lobes rounded, recurved, apex acuminate; lateral veins 4–6 pairs. Inflorescences umbel-like, to 4 × 2.5 cm; peduncle 1.5–2.5 cm. Pedicel ca. 1 cm. Sepals lanceolate, ca. 1.5 × 0.7 mm,

near center, otherwise glabrous. Corona deeply 5-lobed; lobes lanceolate, ca. 3.5 mm, longer than gynostegium, with slender, ligulate, adaxial appendage incumbent on anther.

Anther appendages ovate; pollinia oblong. Follicles lanceolate in outline, 9–10 × ca. 1 cm, with 2 inconspicuous longitudinal ridges, glabrous. Seeds ovate, ca. 1 × 0.5 cm; coma ca. 4 cm. Fl. Jun-Jul, fr. Jul-Nov.

Thickets, roadsides, valleys; 1500 m. Gansu, Hebei, Liaoning, Nei Mongol, Shandong, Shanxi, Zhejiang [Korea].

The root tuber is used as medicine for lumbago, neurasthenia, and insomnia. The plant is the basis of an important Chinese tonic medicine.

**28. *Cynanchum officinale*** (Hemsley) Tsiang & Zhang in Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 90. 1974.

朱砂藤 zhu sha teng

*Pentatropis officinalis* Hemsley, J. Linn. Soc., Bot. 26: 110. 1889; *Cynanchum bodinieri* Schlechter ex H. Léveillé.

Taproots rather fleshy. Stems twining to 4 m, pubescent along 1 line when young. Leaves opposite; petiole 2–6 cm, pubescent; leaf blade ovate or ovate-oblong, 5–12 × 3–7.5 cm, thin papery, glabrous or puberulent, ciliate, base cordate with rounded sinus, apex acuminate; basal veins 3–5 or more. Inflorescences sometimes axillary, umbel-like, 1–8 cm, 10- to many flowered; peduncle 1–2 cm, pubescent. Pedicel 7–10 mm, pubescent. Sepals ovate-oblong, ca. 2 × 0.8 mm, puberulent; basal glands 5. Corolla reflexed; tube ca. 1 mm; lobes oblong, 4.5–5 × ca. 1.8 mm, glabrous outside, minutely villous inside. Corona deeply 5-lobed; lobes ovate, drying darker than corolla, fleshy, as long as or slightly longer than gynostegium, with a rounded, ligulate, adaxial appendage. Pollinia oblong. Follicles divaricate, lanceolate in outline, to 7.5–11 cm × 8–10 mm, with 2 narrow ridges running the whole length, glabrous. Seeds oblong-ovate, apex truncate; coma ca. 2 cm. Fl. May-Aug, fr. Jul-Nov.  $2n = 22$ .

• Thickets, open woods; 1000–2800 m. Anhui, Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan.

The roots are used medicinally for epilepsy, hydrophobia, and detoxifying viper bites.

**29. *Cynanchum auriculatum*** Royle ex Wight, Contr. Bot. India 58. 1834.

牛皮消 niu pi xiao

*Cynanchum saccatum* W. T. Wang ex Tsiang & P. T. Li; *Diploglossum auriculatum* (Royle ex Wight) Meisner; *Endotropis auriculata* (Royle ex Wight) Decaisne; *Vincetoxicum auriculatum* (Royle ex Wight) Kuntze.

Stems twining, puberulent along 1 side to uniformly puberulent, sometimes glabrescent. Leaves opposite; petiole 2.4–3.5(–8.5) cm, axillary stipulelike leaves sometimes present; leaf blade ovate, 4.5–11(–16) × 2.6–7(–11.5) cm, papery, puberulent, densely so on veins abaxially, base cordate with rounded sinus, apex acuminate; basal veins 5, lateral veins 2 or 3 pairs. Inflorescences racemelike, many *plexicaule* var. *castaneum* Makino; *Vincetoxicum amplexicaule* var. *castaneum* (Makino) Kitagawa.

Herbs glabrous except for calyx and corolla. Stems erect, to 1 m tall, often branched from upper axils. Leaves opposite,

flowered, to 23 cm; peduncle 4.5–15 cm. Pedicel 0.9–2.8 cm, puberulent. Sepals lanceolate, 2.2–5.2 × 0.8–2 mm, puberulent; basal glands 5. Corolla white, pale yellow, pink, or purple, rotate; tube short; lobes lanceolate to lanceolate-oblong, 5.5–8(–10) × 2–3 mm, coarsely pubescent to pilose inside. Corona very deeply 5-lobed, white; lobes much longer than gynostegium, elliptic, to ca. 4.5 mm, fleshy, obtuse, with narrowly triangular adaxial appendages. Stigma head conical. Follicles oblong-lanceolate, ca. 8 × 1 cm. Seeds ovate, truncate, ca. 6 × 3 mm; coma ca. 2.5 cm. Fl. Jun-Aug, fr. Aug-Dec.  $2n = 22$ .

Bushland on mountain slopes; 2800–3600 m. Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan].

**30. *Cynanchum boudieri*** H. Léveillé & Vaniot, Bull. Soc. Bot. France 51: CXLIV. 1904.

折冠牛皮消 zhe guan niu pi xiao

*Cynanchum auriculatum* Royle ex Wight var. *amamianum* (Hatusima) T. Yamazaki; *C. ampibolum* C. K. Schneider; *C. taiwanianum* T. Yamazaki; *C. wilfordii* var. *amamianum* Hatusima.

Roots tuberous, 10–50 × 1–4 cm. Stems twining to 5 m, puberulent. Leaves opposite; petiole ca. 5 cm, with adaxial glands; leaf blade broadly ovate to ovate-oblong, 4–>18 × 4–11.5(–17) cm, membranous, adaxially puberulent, base cordate, basal lobes mostly recurved, sometimes incurved, rarely overlapping, apex short acuminate; lateral veins 5 or 6 pairs. Inflorescences racemelike, to 30-flowered; peduncle 6–10 cm. Pedicel ca. 1.5 cm, puberulent. Sepals ovate-oblong, ciliate, pubescent. Corolla white, to 1 cm; tube short; lobes oblong, (3–)3.5–6 × 1.5–1.7 mm, strongly reflexed after anthesis, pilose inside. Corona very deeply 5-lobed; lobes elliptic, fleshy, obtuse, up to 2 × as high as gynostegium, with narrowly triangular adaxial appendages; pollinia oblong. Stigma head conical, apex 2-cleft. Follicles lanceolate in outline, 8–11 cm × 8–10 mm, with 2 longitudinal ridges. Seeds ovate-elliptic. Fl. Jun-Sep, fr. Jul-Dec.

Forest edges, thickets, riversides; 300–3500 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Japan (Ryukyu Islands)].

Root tubers are used medicinally for the treatment of infantile malnutrition caused by intestinal parasites, gastric and duodenal ulcer, nephritis, and neurasthenia.

**31. *Cynanchum amplexicaule*** (Siebold & Zuccarini) Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 104. 1889.

合掌消 he zhang xiao

*Vincetoxicum amplexicaule* Siebold & Zuccarini, Abh. Akad. Muench 4(3): 162. 1846; *Alexitoxicon amplexicaule* (Siebold & Zuccarini) Pobedimova; *Antitoxicum amplexicaule* (Siebold & Zuccarini) Pobedimova; *Cynanchum amplexicaule* var. *castaneum* Makino; *Vincetoxicum amplexicaule* var. *castaneum* (Makino) Kitagawa.

lateral veins 8–10 pairs. Inflorescences extra-axillary and terminal, umbel-like or lax; peduncle 0.5–6 cm. Pedicel ca. 4 mm. Sepals ovate, 1–1.5 × ca. 0.5 mm; basal glands minute. Corolla yellow-green or yellow-brown to purple, rotate; tube ca. 0.5 mm; lobes oblong, 2.5–3.5 × ca. 1 mm, obtuse, puberulent in center. Corona deeply 5-lobed; lobes flattened, ovate, base stipitate, apex rounded to obscurely 3-toothed, as long as corolla tube and gynostegium. Anthers rhomboid, appendages rounded, membranous, as long as anther; pollinia oblong. Stigma head slightly convex. Follicles lanceolate in outline, 5–7(–8) cm × 5–8(–11) mm, glabrous. Seeds oblong-ovate, ca. 5 × 2 mm, dark brown; coma ca. 2 cm, brownish. Fl. May–Sep, fr. Sep–Dec.  $2n = 22$ .

Mountain slopes, grasslands, maritime dunes; 0–1000 m. Guangxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong [Japan, Korea].

All parts are used medicinally for traumatic injury, rheumatic arthralgia, and swelling.

**32. *Cynanchum atratum* Bunge**, Enum. Pl. China Bor. 45. 1833 (1831).

白薇 bai wei

*Alexitoxicon atratum* (Bunge) Pobedimova; *Antitoxicum atratum* (Bunge) Pobedimova; *Cynanchum multinerve* (Franchet & Savatier) Matusma; *Vincetoxicum atratum* (Bunge) Morren & Decaisne; *V. multinerve* Franchet & Savatier.

Herbs, most parts densely pubescent to tomentose. Roots fibrous, fragrant. Stems erect, to 50 cm, sometimes ± inflated. Leaves opposite; petiole ca. 5 mm; leaf blade ovate or ovate-oblong, 5–8(–12) × 3–4(–7) cm, papery, base rounded or sometimes obscurely cordate, apex acute or acuminate; lateral veins 6 or 7 pairs. Inflorescences umbel-like, sessile, 8–10-flowered. Pedicel ca. 1.5 cm. Sepals lanceolate, ca. 3 mm, ciliate, pubescent; basal glands 5. Corolla deep purple, rotate, 1–1.2(–2.2) cm in diam., pubescent outside, glabrous inside; lobes ovate-triangular, 4–7 × 3–3.7 mm, ciliate. Corona deeply 5-lobed; lobes as long as gynostegium, apex rounded, adnate to anthers. Anther appendages rounded; pollinia oblong-ellipsoid. Stigma head depressed. Follicles fusiform to lanceolate in outline, 5.5–11 × 0.5–1.5 cm, base obtuse, apex attenuate, not ridged. Seeds light brown, 4–6 × 3–4 mm; coma 3–4.5 cm. Fl. Apr–Aug, fr. Jun–Oct.  $2n = 22^*$ .

Grasslands, riversides, drylands; 100–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan [Japan, Korea, E Russia].

The roots are used medicinally for urinary tract infection, gonorrhoea, nephritis, edema, bronchitis, and rheumatic arthralgia.

**33. *Cynanchum canescens* (Willdenow) K. Schumann** in Engler & Prantl, Nat. Pflanzenfam. 4(2): 252. 1895.

2.5 × 0.7–0.9 mm, sparsely pubescent to glabrescent. Corolla yellow, glabrous except sometimes for a few hairs inside tube; tube 1–1.3 mm; lobes rotate, ovate-oblong, 2.5–4 × 1–2 mm. Corona lobes thick, ± triangular, acute, longer than gynostegium, basally attached to anthers, tip sometimes

粉绿白前 fen lu bai qian

*Asclepias canescens* Willdenow, Ges. Naturf. Freunde Berlin Neue Schriften 3: 418. 1801; *Cynanchum glaucum* Wallich ex Wight; *Vincetoxicum canescens* (Willdenow) Decaisne; *V. glaucum* (Wallich ex Wight) K. H. Rechinger; *V. hirundinaria* Medicus subsp. *glaucum* (Wallich ex Wight) H. Hara.

Herbs, most parts canescent or puberulent. Rhizomes with dense fascicles of roots. Stems erect, to 50 cm, flexuous, pale or glaucous. Petiole 2–15 mm; leaf blade ovate to oblong, or lanceolate, 2.5–8 × 1.5–5 cm, leathery, base rounded to cordate, apex acuminate or apiculate. Inflorescences usually sessile, umbel-like, pubescent. Pedicel 2–7 mm. Sepals ca. 0.7 × 0.4 mm, puberulent. Corolla yellow or green fading to greenish orange; tube ca. 1 mm; lobes ovate, 2–3 × ca. 1.5 mm, glabrous outside, sparsely hirsute inside, apex subacute. Corona lobes broadly ovate, fleshy, apex rounded, broader than long. Follicles slender, 5–10 cm. Seeds broadly ovate, 5–7 mm, comose. Fl. May–Aug, fr. Aug–Dec.  $2n = 22$ .

Open woodland, thickets; 2500 m. Sichuan, Xizang, Yunnan [Afghanistan, Bhutan, India, Kashmir, Nepal, Pakistan, Russia; SW Asia].

Extensive field work is needed to establish the extent of variation in the characters used to separate members of the *Cynanchum vincetoxicum* complex, including species 34–37. Two species groups, separated arbitrarily by the presence or absence of corolla hairs, are recognized. The group with hairy corollas includes *C. Forrestii*, *C. bicampanulatum*, and *C. rockii*. Although most material with glabrous corollas belongs to *C. inamoenum*, some collections from widely scattered localities between the Himalayas and Taiwan have been named as *C. vincetoxicum*. It is not clear that these are discontinuous with *C. inamoenum* and that they represent true *C. vincetoxicum*. For the present, all material with glabrous flowers is included in *C. inamoenum*.

**34. *Cynanchum inamoenum* (Maximowicz) Loesener**, Bot. Jahrb. Syst. 34 (Beibl. 75): 60. 1904.

竹灵消 zhu ling xiao

*Vincetoxicum inamoenum* Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 9: 787. 1876; *Alexitoxicon inamoenum* (Maximowicz) Pobedimova; *Antitoxicum inamoenum* (Maximowicz) Pobedimova; *Vincetoxicum macrophyllum* Siebold & Zuccarini var. *nikoense* Maximowicz.

Stems simple, erect, to 70 cm, hollow, pubescent along 1 line, apical part densely pubescent. Leaves opposite; petiole 0–6 mm; leaf blade broadly ovate, 3–7 × 1.5–5 cm, puberulent along veins, glabrescent, base rounded to subcordate, apex acute to acuminate; lateral veins ca. 5 pairs. Inflorescences umbel-like, (3–)8–10-flowered; peduncle 0.4–2.5 cm, pubescent. Pedicel 3–8 mm, pubescent. Sepals lanceolate, 2–

inflexed. Anther appendages rounded; pollinia oblong. Stigma head convex. Follicles linear-lanceolate in outline, 4–6 cm × 5–10 mm, glabrous, mostly solitary, divergent when paired. Fl. May–Jul.  $2n = 44$ .

Open woodland, thickets, grassy mountain slopes; 100–3500 m. Anhui, Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Liaoning, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Zhejiang [Japan, Korea, Russia].

The roots are used for the treatment of scrofula, rupture, scabies, and internal fever.

**35. *Cynanchum forrestii*** Schlechter, Notes Roy. Bot. Gard. Edinburgh 8: 15. 1913.

大理白前 da li bai qian

*Cynanchum balfourianum* (Schlechter) Tsiang & Zhang; *C. forrestii* var. *balfourianum* Schlechter; *C. forrestii* var. *stenolobum* Tsiang & Zhang; *C. limprichtii* Schlechter; *C. muliense* Tsiang; *C. steppicola* Handel-Mazzetti; *Vincetoxicum balfourianum* (Schlechter) C. Y. Wu & D. Z. Li; *V. forrestii* (Schlechter) C. Y. Wu & D. Z. Li; *V. forrestii* var. *stenolobum* (Tsiang & Zhang) C. Y. Wu & D. Z. Li; *V. limprichtii* (Schlechter) C. Y. Wu & D. Z. Li; *V. muliense* (Tsiang) C. Y. Wu & D. Z. Li; *V. steppicola* (Handel-Mazzetti) C. Y. Wu & D. Z. Li.

Plants perennial. Rootstocks dense clusters of little-branched roots. Stems erect, often clustered, tips sometimes tending to twine, to 60 cm tall, usually unbranched, pubescent along 1 side, apical parts densely pubescent. Petiole 5–10 mm, puberulent; leaf blade broadly ovate to rarely elliptic-oblong, 2.5–8 × 1.5–4 cm, thin papery, glabrescent, base cuneate or obtuse to subcordate especially near base of plant, apex obtuse or acute; lateral veins 5–7 pairs, puberulent. Inflorescences extra-axillary or subterminal, umbel-like, shorter than leaves; peduncle 0–5 cm. Pedicel 5–8 mm. Sepals lanceolate or narrowly triangular, 1.5–2.5 × 0.5–0.8 mm, sometimes ciliate; basal glands 5, minute. Corolla yellow to brownish or purple; tube 1–2 mm; lobes rotate, ovate-oblong or oblong, to 3–7.5 × 1.5–2 mm, inside pubescent or puberulent except sometimes for lobes, outside glabrous or puberulent, margin sometimes ciliate. Corona deeply lobed; lobes triangular-ovate, fleshy, at least as long as gynostegium, apex blunt, sometimes extended and sharply incurved. Pollinia oblong; stigma head elevated, retuse. Follicles often pendent, lanceolate in outline, 5–9.6 × 0.7–1.2 cm, sometimes paired and diverging at ca. 90°. Seeds oblong, ca. 8 × 3–4 mm; coma 1–2 cm. Fl. Apr-Jul, fr. Jun-Nov.

• Alpine waste places, grass savanna, humid grasslands; 1000–5000 m. Gansu, Guizhou, Sichuan, Xizang, Yunnan.

The roots are diuretic and are used to relieve pain.

**36. *Cynanchum bicampanulatum*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, Novon 5: 5. 1995.

钟冠白前 zhong guan bai qian

and apex acute; lateral veins obscure. Inflorescences terminal and from upper nodes, laxly branched, to 7 cm; peduncle 2.5–4 cm. Pedicel 5–10 mm. Sepals lanceolate, 1–1.5 × ca. 0.5 mm; glands present or absent. Corolla yellow-green, subrotate, glabrous; tube short; lobes ovate, 4–5.5 × 1.5–3 mm. Corona deeply 5-lobed; lobes ovate-oblong, fleshy, slightly

Roots not seen. Stems ascending, to 30 cm, minutely puberulent mainly along 2 sides. Petiole 4–9 mm; leaf blade oblong-ovate, 5.5–7 × 4–4.5 cm, base shallowly cordate, truncate or rounded, margin puberulent, apex acute to subacuminate; basal veins 5–7, lateral veins 4 or 5 pairs. Inflorescences umbel-like; cymules several flowered, separated by very short rachis; peduncle 0.8–1.8 cm, puberulent. Pedicel 5–8 mm, to 12 mm in fruit, puberulent. Sepals oblong, ca. 1.5 × 0.5 mm, apex rounded, almost glabrous. Corolla campanulate, ca. 4 mm; glabrous except for a few stiff hairs inside tube, color not recorded, probably yellow or white; tube ca. 2 × 3 mm; lobes oblong-ovate, ca. 1.7 × 1.5 mm, apex rounded, usually revolute. Corona tube as high as anthers, membranous; lobes inflexed, rounded, fleshy, adnate to corolla tube and to anthers opposite lobes. Anthers square, subgibbous; anther appendages ovate, inflexed over stigma head; pollinia ovoid, ca. 0.2 mm. Stigma head dark, rounded. Young fruit paired, glabrous, beaked fusiform. Fl. Jul.

• Open fields; 2400–2700 m. Gansu, Sichuan (Tachienlu).

**37. *Cynanchum rockii*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, Novon 5: 8. 1995.

高冠白前 gao guan bai qian

Stems erect, to 30 cm, branched, pubescent. Leaves opposite; petiole 5–11 mm; leaf blade ovate, ca. 5 × 3 cm, abaxially densely puberulent on veins, adaxially sparsely pubescent, base rounded to broadly cuneate, apex acuminate; lateral veins 3 or 4 pairs. Inflorescences up to 7-flowered, slender, often forked with umbel-like clusters of flowers, to 3.6 cm; peduncle ca. 1.8 cm. Pedicel ca. 6 mm. Sepals lanceolate, ca. 2.2 × 0.5 mm. Corolla dark red; tube ca. 2 mm; lobes erect, ca. 4 × 1.5 mm, triangular-acuminate, glabrous outside, throat with woolly hairs, tube and lobes glabrous, apex blunt. Corona lobes almost free, ovate, higher than gynostegium, apex rounded, adnate to anther, without internal appendages. Fruit not seen.

• Alpine meadows; 3300 m. Sichuan.

**38. *Cynanchum paniculatum*** (Bunge) Kitagawa, J. Jap. Bot. 16: 20. 1940.

徐长卿 xu chang qing

*Asclepias paniculata* Bunge, Enum. Pl. China Bor. 43. 1833 (1831); *Cynanchum dubium* Kitagawa; *Pycnostelma chinense* Bunge ex Decaisne; *P. leucanthum* Kitagawa; *P. paniculatum* (Bunge) K. Schumann; *Vincetoxicum paniculatum* (Bunge) C. Y. Wu & D. Z. Li; *V. pycnostachys* Kitagawa.

Roots densely fibrous, fragrant. Stems slender, erect, to 1 m, glabrous or hispid below, rigid, unbranched or with few branches from upper parts. Leaves opposite; petiole ca. 3 mm; leaf blade lanceolate to linear, 5–13 × 0.5–1.5 cm, stiffly papery, glabrous or adaxially puberulent, ciliate, base

laterally compressed, apex obtuse, as long as anthers, adaxially keeled up to middle and adnate to anthers. Anther appendages semiorbicular, slightly shorter than stigma head; pollinia oblong. Stigma head subumbonate. Follicles lanceolate in outline, 4–8 cm × 3–8 mm. Seeds oblong, ca. 5 × 3 mm; coma 1.5–3 cm. Fl. May-Jul, fr. Aug-Dec.  $2n = 22^*$ .

Sunny mountain slopes. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Mongolia].

All parts are used as medicine for the treatment of stomachache, enteritis, infantile malnutrition due to intestinal parasites, toothache, traumatic injury, and snake bites.

**39. *Cynanchum wangii*** P. T. Li & W. Kittredge, *Novon* 2: 220. 1992.

启无白前 qi wu bai qian

Stems erect, 10–20 cm, many branched, ca. 1 mm in diam., puberulent along 1 side. Leaves opposite, linear-spatulate, 5–20 × 1–2 mm, glabrous, base cuneate, apex rounded; lateral veins obscure. Inflorescences extra-axillary or terminal, umbel-like, 3–7-flowered; peduncle slender, 3–8 cm, puberulent. Pedicel 4–7 mm. Sepals ovate-triangular, ca. 1 × 0.5 mm, glabrous; basal glands 5. Corolla greenish yellow, rotate; tube ca. 1 mm, glabrous; lobes oblong-lanceolate, ca. 4 × 1 mm, glabrous outside, densely pubescent inside. Corona deeply 5-lobed; lobes semiorbicular, ca. 0.5 × 0.5 mm, erect, somewhat fleshy, apex rounded, nearly half as long as anther appendages. Anthers oblong, appendage rounded, as long as stigma head; pollinia oblong-ovoid. Stigma head disclike, apex slightly elevated. Fl. May–summer.

- Among bare rocks along river banks; 700–900 m. Yunnan.

**40. *Cynanchum mongolicum*** (Maximowicz) Hemsley in F. B. Forbes & Hemsley, *J. Linn. Soc., Bot.* 26: 107. 1889.

华北白前 hua bei bai qian

*Vincetoxicum mongolicum* Maximowicz, *Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg* 9: 780. 1876; *Cynanchum hancockianum* (Maximowicz) Iljinski; *C. komarovii* Iljinski; *C. lateriflorum* (Hemsley) Kitagawa; *Pycnostelma lateriflorum* Hemsley; *Vincetoxicum hancockianum* (Maximowicz) C. Y. Wu & D. Z. Li; *V. lateriflorum* (Hemsley) Kitagawa; *V. mongolicum* var. *hancockianum* Maximowicz.

Herbs usually glabrous, rarely sparsely puberulent, glaucous. Stems erect, to 50 cm tall, occasionally puberulent along 1 side, glabrescent. Leaves opposite or whorled; petiole 0–5 mm; leaf blade narrowly oblong-elliptic to lanceolate or rhomboid, 3–10 × 0.5–3 cm, leathery or thick papery, base cuneate, margin sometimes ciliate, apex acuminate or acute; lateral veins ca. 4 pairs, often obscure. Inflorescences umbel-like, shorter than leaves; peduncle ca. 1.2 cm. Pedicel ca. 5 mm. Sepals ovate-lanceolate, 1–1.7 × 0.5–1 mm; basal glands 5. Corolla purple; tube ca. 1 mm; lobes ovate, 2–3 × 1.5–2 mm, glabrous. Corona deeply 5-lobed; lobes fleshy, 2 separated by a short rachis; peduncle 0.5–1(–1.7) cm. Sepals ovate, ca. 1.3 × 0.7 mm. Buds ca. 3 mm. Corolla deep purple, white, or pale yellow, rotate; tube short; lobes ovate, obtuse, villous inside. Corona shallowly cupular; lobes fleshy, ovate, thick, pouched, apex rounded, each lobe adnate ventrally to anther and dorsally to corolla. Pollinia oblong; stigma head slightly convex. Follicles linear-lanceolate in outline, ca. 4 cm

keeled, obtuse, ca. as long as anthers. Pollinia ovoid. Stigma head depressed to slightly elevated. Follicles oblong-lanceolate, 6.5–7 cm × 5–10 mm, with 2–4 narrow ridges along beak, usually solitary, hanging when ripe. Seeds oblong, ca. 5 × 3 mm; coma ca. 2 cm. Fl. May–Aug, fr. Jun–Nov.

- Mountains, sand barrens; to 3000 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.

All parts are used internally for relieving pain and externally for treating rheumatoid arthritis, traumatic injury, and abscesses.

The correct position of *Cynanchum mongolicum* var. *hupehense* Pampanini (*Nuovo Giorn. Bot. Ital.* 17: 695. 1910) is not known.

**41. *Cynanchum glaucescens*** (Decaisne) Handel-Mazzetti, *Symb. Sin.* 7: 994. 1936.

白前 bai qian

*Pentasachme glaucescens* Decaisne in A. de Candolle, *Prodr.* 8: 627. 1844; *Cynanchum lightii* Dunn; *Vincetoxicum glaucescens* (Decaisne) C. Y. Wu & D. Z. Li.

Herbs rhizomatous, roots fibrous, fascicled at nodes. Stems erect, to 60 cm, pubescent along 2 lines. Leaves opposite, subsessile; leaf blade glabrous, elliptic, oblong-lanceolate, or oblong, 1–7 cm × 7–12 mm, base cuneate or rounded, apex rounded to ± acute; lateral veins 3–5 pairs, obscure. Inflorescences umbel-like, sometimes with 2 cymes separated by a short rachis, shorter than leaves, glabrous or puberulent. Sepals oblong-lanceolate, ca. 2.3 × 1 mm, glabrous, basal glands 5. Corolla yellow, rotate, ca. 8 mm in diam.; lobes ovate-oblong, ca. 3.5 × 2.3 mm, obtuse. Corona shallowly cupular, 5-lobed; lobes ovate, fleshy, incurved, slightly shorter than anthers and adnate to them. Pollinia ovoid. Stigma head convex. Follicles fusiform, 4.5–6 cm × 6–1 mm. Seeds oblong, ca. 5 mm; coma ca. 2 cm. Fl. May–Nov, fr. Jul–Dec.

- Mountains, riversides; 100–800. Fujian, Guangdong, Guangxi, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang.

The roots are used as medicine for reducing phlegm and against coughs.

**42. *Cynanchum stenophyllum*** Hemsley in F. B. Forbes & Hemsley, *J. Linn. Soc., Bot.* 26: 108. 1889.

狭叶白前 xia ye bai qian

*Vincetoxicum stenophyllum* (Hemsley) Kuntze.

Roots fascicled. Stems erect, to 40 cm, pubescent along 1 side. Petiole ca. 2 mm; leaf blade linear-lanceolate, ca. 6 cm × 5 mm. Inflorescences umbel-like, 2–2.5 cm, sometimes × 5 mm. Seeds oblong-ovate, ca. 7 × 3 mm; coma ca. 2 cm. Fl. May.

- Moist lowlands. Guizhou, Hubei, Sichuan.

**43. *Cynanchum hydrophilum*** Tsiang & Zhang in Tsiang & P. T. Li, *Acta Phytotax. Sin.* 12: 94. 1974.

水白前 shui bai qian

*Vincetoxicum hydrophilum* (Tsiang & Zhang) C. Y. Wu & D. Z. Li.

Stems erect, to 50 cm, minutely puberulent, hollow when dry. Leaves opposite or occasionally in whorls of 3; petiole 5–7 mm; leaf blade narrowly elliptic, 6–9 × 0.6–1.5 cm, base and apex acuminate; lateral veins ca. 6 pairs, puberulent. Inflorescences axillary, corymbose, or umbel-like; peduncle 0.2–2.2 cm, puberulent. Pedicel 6–10 mm. Sepals triangular, 1.5–2 × 0.5–0.6 mm, puberulent outside, glabrous inside; basal glands 5. Corolla white, rotate; lobes ovate, ca. 4 × 2 mm, obtuse, glabrous outside, puberulent inside. Corona deeply 5-lobed; lobes ovate, slightly shorter than gynostegium. Pollinia elliptic. Stigma head rounded, apex depressed. Fl. Jun.

• In shallow water or water-logged sites; 1100–1200 m. Sichuan.

**44. *Cynanchum verticillatum*** Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 109. 1889.

轮叶白前 lun ye bai qian

*Cynanchum leveilleianum* Schlechter ex H. Léveillé; *C. verticillatum* var. *arenicola* Tsiang & Zhang; *Vincetoxicum verticillatum* (Hemsley) Kuntze; *V. verticillatum* var. *arenicola* (Tsiang & Zhang) C. Y. Wu & D. Z. Li.

Herbs perennial, erect, to 60 cm tall, glabrescent except for stems and inflorescences. Stems simple or branched, puberulent on 1 side. Leaves opposite or in whorls of 3–6; petiole ca. 1 cm; leaf blade membranous, linear-lanceolate, 5–10(–17) × 0.7–1.5 cm, acuminate at both ends; lateral veins ca. 7 pairs, slightly elevated abaxially. Inflorescences subterminal, umbel-like or racemelike, 6–10-flowered; peduncle 0.2–1.5(–2.5) cm, pubescent along 1 side. Pedicel slender, ca. 1 cm. Sepals lanceolate, ca. 2 × 0.6 mm, acute, puberulent abaxially or glabrous, margin sometimes ciliate; basal glands few. Corolla pale yellow, white, or dark red, rotate, glabrous; tube ca. 1 mm; lobes ovate-oblong, 3–5.5 × 2–2.5 mm, acute. Corona lobes triangular, fleshy, adnate to anthers, joined laterally to form a thin tube ca. as high. Anthers square to oblong, appendages acute; pollinia oblong. Stigma head discoid, 5-angled, depressed, entire. Follicles lanceolate in outline, ca. 5 × 1 cm, smooth. Fl. Apr-Jul, fr. Jul-Aug.

• Valleys, moist sandy tracts, along ditches; 500–1000 m. Guangxi, Guizhou, Hubei, Sichuan, Yunnan.

**45. *Cynanchum riparium*** Tsiang & Zhang in Tsiang & P. T. Li, Acta Phytotax. Sin. 12: 96. 1974.

荷花柳 he hua liu

the latter can easily be distinguished by the longer, white, glabrous corollas.

**47. *Cynanchum acuminatifolium*** Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 104. 1889.

潮风草 chao feng cao

*Vincetoxicum acuminatum* Decaisne in A. de Candolle,

*Vincetoxicum riparium* (Tsiang & Zhang) C. Y. Wu & D. Z. Li.

Herbs glabrous throughout. Stems erect, to 60 cm. Lower leaves in whorls of 4, upper leaves opposite, ± sessile; leaf blade linear, 3.5–12 cm × 2–9 mm, papery, base attenuate, decurrent; lateral veins obscure. Inflorescences axillary, shorter than leaves; peduncle 0.7–1.5 cm. Pedicel 4–5 mm. Sepals ovate, ca. 1.5 × 0.7 mm, apex acuminate; basal glands present. Corolla purple, rotate; tube short; lobes oblong, ca. 2 × 1.7 mm, apex acute. Corona deeply 5-lobed, up to as long as gynostegium; lobes ovate, obtuse, with a basal adaxial scar. Anthers square, appendages rounded; pollinia ovoid. Stigma head elevated. Fl. May.

• Grassy areas in upper beds of Yellow River. Henan.

**46. *Cynanchum stauntonii*** (Decaisne) Schlechter ex H. Léveillé, Mem. Real. Acad. Ci. Barcelona 12: 4. 1916.

柳叶白前 liu ye bai qian

*Pentasachme stauntonii* Decaisne in A. de Candolle, Prodr. 8: 627. 1844; *Cynanchum linearifolium* Hemsley; *Pentasachme brachyantha* Handel-Mazzetti; *Vincetoxicum linearifolium* (Hemsley) Kuntze; *V. stauntonii* (Decaisne) C. Y. Wu & D. Z. Li.

Herbs glabrous except for corolla and sometimes interpetiolar lines. Roots fascicled, slender. Stems erect, to 1 m. Leaves opposite; petiole ca. 5 mm; leaf blade narrowly lanceolate, 6–13 cm × 3–9(–17) mm, papery, acuminate at both ends; lateral veins ca. 6 pairs. Inflorescences slender, racemelike; peduncle up to 1.7 cm. Pedicel 3–9 mm. Sepals ovate-oblong, 1–1.5 × 0.4–0.5 mm; basal glands few. Corolla purple, less often greenish yellow, rotate; tube ca. 1.5 mm; lobes linear-oblong, 3–5(–8) × 0.6–1 mm, obtuse, interior minutely and conspicuously villous at base, sometimes throughout. Corona lobes 5, ovate, pouched, blunt, adaxially keeled, shorter than anthers and adnate to them at base. Anther appendages rounded, covering stigma head; pollinia oblong. Stigma head convex, included. Follicles linear-lanceolate in outline, 9–12 cm × 3–6 mm, smooth, glabrous. Seeds oblong; coma ca. 2.5 cm. Fl. May-Aug, fr. Sep-Dec.

• Sunny places in moist woodland, water-logged lands; low to medium elevations. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang.

Decoctions of all parts are used as a febrifuge and for treating internal fever. The roots are used medicinally for pulmonary tuberculosis, infantile malnutrition due to intestinal parasites, influenza, cough, and chronic bronchitis.

*Cynanchum stauntonii* is sometimes confused with *Pentasachme caudatum*, which is similar in habit and grows in similar habitats, but

Prodr. 8: 524. 1844, not Humboldt & Bonpland ex Schultes (1820); *Alexitoxicon acuminatum* (Decaisne) Pobedimova; *Antitoxicon acuminatum* (Decaisne) Pobedimova; *Cynanchum acuminatum* (Decaisne) Matsumura (1912), not Humboldt & Bonpland ex Schultes (1820).

Herbs pubescent or puberulent. Rootstock a short rhizome, roots clustered. Stems erect, to 60 cm. Leaves opposite or in whorls of 4; petiole ca. 1 cm; leaf blade elliptic

or broadly ovate, 7–13 × 4–5 cm, membranous, base broadly cuneate or rounded, apex acuminate; lateral veins 6 or 7 pairs. Inflorescences terminal and subterminal, umbel-like, 10–12-flowered, 3–5 cm. Sepals ovate; basal glands 5. Corolla white, rotate, 1–1.5 cm in diam.; lobes oblong, to 7.5 × 3 mm, glabrous. Corona cupular, 5-lobed to middle; lobes triangular, fleshy, as long as gynostegium, adnate to anther. Pollinia ovoid. Follicles solitary, erect, lanceolate in outline, 6–7 cm × 5 mm. Seeds oblong; coma ca. 2 cm. Fl. Jun-Aug, fr. Aug-Nov.

Sunny open woods, grasslands on mountain slopes. Anhui, Hebei, Jilin, Liaoning, Shandong [Japan, Korea, E Russia].

The roots are diuretic.

**48. *Cynanchum pingshanicum*** M. G. Gilbert & P. T. Li in M. G. Gilbert, W. D. Stevens, & P. T. Li, *Novon* 5: 8. 1995.

平山白前 ping shan bai qian

Stems 30–60 cm high, tending to twine at tip in larger plants; internodes at first pubescent, soon glabrescent. Lower leaves reduced; upper leaves large, petiole 1–2 cm; leaf blade ovate to elliptic, 7.5–15 × 3.7–8.5 cm, abaxially puberulent on veins, adaxially uniformly puberulent, base cuneate to truncate and decurrent along petiole; lateral veins 5–8 pairs. Uppermost leaves much reduced. Inflorescences at upper nodes, uppermost usually longer than subtending leaves, irregularly forked to umbel-like, many flowered; peduncle 1–6.5 cm, glabrescent. Pedicel 6–9 mm, glabrous or sparsely puberulent. Sepals triangular-lanceolate, ca. 2 × 0.6–0.8 mm, glabrous except for ciliate margin. Corolla probably white, ca. 1.2 cm in diam., glabrous; lobes oblong-triangular, ca. 6 × 2 mm, apex obtuse. Corona fleshy, 5-lobed to near base, slightly shorter than anthers; lobes bluntly triangular, free from gynostegium, without internal appendages. Fl. Jun.

• No data on ecology. Sichuan (Mei-huei-t'ouo; P'ing Shan, SW of Nan Yéi).

**49. *Cynanchum biondioides*** W. T. Wang ex Tsiang & P. T. Li, *Acta Phytotax. Sin.* 12: 106. 1974.

秦岭藤白前 qin ling teng bai qian

*Vincetoxicum biondioides* (W. T. Wang) C. Y. Wu & D. Z. Li.

Rhizomes ca. 3 mm in diam. Stems twining, to 2 m, pubescent along 1 line. Petiole 5–10 mm; leaf blade narrow elliptic, 3.5–13 × 0.5–1.8 cm, papery, glabrous or adaxially scabrous, base cuneate to shallowly cordate, apex acute to rounded-apiculate; lateral veins obscure. Inflorescences umbel-like, 5–10-flowered; peduncle 0–8 mm, puberulent. Inflorescences very slender, umbel-like, sometimes branched, 2–2.5 cm; peduncle to 5 mm, puberulent. Pedicel ca. 7 mm. Sepals ovate-lanceolate, ciliate. Corolla purple or purple-red, rotate, ca. 5 × 11 mm; tube short; lobes ovate-oblong, obtuse, glabrous. Corona lobes triangular-ovate, shorter than or as long as gynostegium, apex obtuse, with an oblong adaxial appendage. Anthers nearly square, appendages rounded; pollinia ellipsoid. Stigma head broadly discoid, somewhat depressed. Follicles lanceolate in outline, ca. 5.5 × 1.5 cm,

Pedicel 5–10 mm, slender, puberulent. Sepals ovate, 1.2–2 × 0.8–1.3 mm, glabrescent; basal glands many. Corolla yellow-green; tube ca. 2 mm; lobes erect, ovate, 4–5 × 2.5–3 mm, glabrous. Corona 1.5–1.7 mm, ca. 1/2 as high as gynostegium; lobes triangular-ovate, apex rounded, adnate ventrally to anthers. Anther appendages ovate; pollinia ovoid. Stigma head elevated. Fl. Mar-Jul.

• Thickets; 2100 m. Yunnan (Luquan, Lancang).

**50. *Cynanchum versicolor*** Bunge, *Enum. Pl. China Bor.* 44. 1833 (1831).

变色白前 bian se bai qian

*Cynanchum mandshuricum* (Hance) Hemsley; *Vincetoxicum mandshuricum* Hance; *V. versicolor* (Bunge) Decaisne.

Plants tomentose or pubescent throughout. Stems to 2 m, lower part erect with larger and broader leaves, upper fertile part twining with smaller and narrower leaves. Petiole 3–15 mm; lower leaf blades broadly ovate or elliptic, 7–10 × 3–6 cm, papery, base rounded or subcordate, ciliate; lateral veins 6–8 pairs. Inflorescences umbel-like, up to 12-flowered; peduncle 0–10 mm, tomentose. Pedicel 3–5 mm. Sepals linear-lanceolate, 2–3 × ca. 0.5 mm; basal glands 5. Corolla yellow-white to dark purple, rotate to campanulate; tube ca. 0.5 mm; lobes ovate-triangular, ca. 2.5 × 2 mm, pubescent. Corona shorter than gynostegium; lobes triangular, fleshy, somewhat laterally compressed, adnate to anthers. Anthers rhomboid, appendages rounded; pollinia ellipsoid. Stigma head slightly convex. Follicles broadly lanceolate in outline, 4–5 cm × 8–10 mm. Seeds ovate, ca. 5 × 3 mm; coma ca. 2 cm. Fl. May-Aug, fr. Jul-Nov.  $2n = 22^*$ .

• Thickets, riversides; 0–800 m. Hebei, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Shandong, Sichuan, Zhejiang.

The roots and rhizomes are used as diuretic and for the treatment of pulmonary tuberculosis, edema, and gonorrhoea.

**51. *Cynanchum chekiangense*** M. Cheng in Tsiang & P. T. Li, *Acta Phytotax. Sin.* 12: 101. 1974.

蔓剪草 man jian cao

*Vincetoxicum chekiangense* (M. Cheng) C. Y. Wu & D. Z. Li.

Roots fibrous, fascicled. Stems simple, to 1 m, basal part erect, apical part twining, very sparsely puberulent. Petiole 2–2.5 cm; leaf blade elliptic, 10–28 × 4–15 cm, upper leaves much smaller, thin papery, puberulent or pilose to glabrous, apex acute or acuminate, base acute; lateral veins 5–8 pairs.

often solitary. Seeds broadly ovate, ca. 5 × 3 mm; coma 3–5 cm. Fl. May, fr. Jun-Sep.

• Moist thickets, valleys. Guangdong, Henan, Hubei, Hunan, Zhejiang.

The roots are used for the treatment of traumatic injury and scabies.



**52. *Cynanchum taihangense*** Tsiang & Zhang in Tsiang & P. T. Li, *Acta Phytotax. Sin.* 12: 102. 1974.

太行白前 tai hang bai qian

*Cynanchum gracilipes* Tsiang & Zhang; *Vincetoxicum gracilipes* (Tsiang & Zhang) C. Y. Wu & D. Z. Li; *V. taihangense* (Tsiang & Zhang) C. Y. Wu & D. Z. Li.

Stems simple, to 1.5 m, hollow when dry, puberulent, basal part erect, apical part twining. Leaves opposite; petiole 1–3.5 cm; leaf blade narrowly elliptic to elliptic, 8–23 × 2.5–10 cm, membranous or thin papery, pubescent to puberulent, base cuneate, apex acuminate or caudate-acuminate; lateral veins 6–8 pairs. Inflorescences umbel-like, usually dichotomous, shorter than leaves; peduncle 2–5 cm, puberulent. Pedicel 1–2 cm. Sepals lanceolate, 1.5–2.5 × 0.5–0.7 mm, puberulent to glabrous outside, ciliate; basal glands present or absent. Corolla yellow-green, rotate; tube short; lobes oblong, 5–7.5 × 2–2.5 mm. Corona slightly shorter than gynostegium; lobes broadly ovate-triangular, obtuse to subacute, adnate to anthers. Anthers nearly square, apical membrane ovate-triangular; pollinia oblong. Stigma head elevated. Fl. Jun-Aug.

- Thickets along valleys. Anhui, Shanxi.

**53. *Cynanchum linearisepalum*** P. T. Li, *Acta Bot. Yunnan.* 12(1): 20. 1990.

线萼白前 xian e bai qian

Herbs, most parts pubescent. Stems twining to 4 m. Petiole 1–2 cm; leaf blade ovate or oblong-ovate, 5–9 × 2.2–6.7 cm, base subcordate to truncate, apex short acuminate; lateral veins 5 or 6 pairs. Inflorescences 4–7 cm; peduncle to 6 cm, puberulent. Pedicel 1.5–2.2 cm. Sepals linear-lanceolate, 3–3.5 × 0.5–0.7 mm, glabrous; basal glands 5. Corolla glabrous; lobes ovate, 5–5.5 × ca. 3 mm, apex obtuse. Corona ca. 1/2 as long as gynostegium; lobes ovate-triangular, fleshy, with ovate, adaxial scale. Pollinia oblong-ovate. Stigma head discoid. Fl. Sep.

- Among shrubs along rivers; 2300 m. Sichuan (Muli).

*Cynanchum linearisepalum* may prove to be just a robust form of *C. mooreanum*.

**54. *Cynanchum mooreanum*** Hemsley in F. B. Forbes & Hemsley, *J. Linn. Soc., Bot.* 26: 108. 1889.

毛白前 mao bai qian

*Vincetoxicum chinense* S. Moore, *J. Bot.* 13: 228. 1875, (not *Cynanchum chinense* R. Brown 1810); *Cynanchum affine* Hemsley; *Vincetoxicum affine* (Hemsley) Kuntze.

Plants slender climbers. Stems twining, to 2 m, densely puberulent; basal glands 5. Corolla yellow-white, ca. 7 mm in diam., glabrous; lobes oblong, ca. 9 × 3 mm. Corona lobes 5, thin, rounded, shorter than gynostegium, each attached adaxially to anther. Pollinia ovate-oblong. Stigma head slightly elevated. Follicles lanceolate in outline, 5–6 × ca. 1 cm. Seeds ovate, flattened; coma ca. 2.5 cm. Fl. May-Aug, fr. Aug-Dec.

- Open woodland, thickets; 200–800 m. Fujian, Guangdong,

pubescent. Leaves opposite; petiole 1–2 cm, pubescent; leaf blade ovate-cordate to ovate-oblong, 2–8 × 1.5–3 cm, smaller in the inflorescence, pubescent, base cordate or truncate, apex acute; lateral veins 4 or 5 pairs. Inflorescences umbel-like, to 9-flowered; peduncle 0–1.5(–4) cm, pubescent. Pedicel 5–13 mm. Sepals ovate, ca. 2.5 mm, pubescent; basal glands minute. Corolla purple, rotate, glabrous, deeply divided; lobes oblong-lanceolate, 6.5–8(–10) × 2–2.5 mm. Corona cupular, 5-lobed; lobes ovate to ± square, obtuse to truncate, shorter than gynostegium, adnate at base to corresponding anther. Anther appendages broadly ovate; pollinia ovate-oblong. Stigma head depressed. Follicles lanceolate in outline, 7–9 × ca. 1 cm. Seeds brown, oblong, comose. Fl. Jun-Jul, fr. Aug-Dec.

- Thickets, open woods; 200–800 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangxi, Zhejiang.

**55. *Cynanchum sublanceolatum*** (Miquel) Matsumura, *Index Pl. Jap.* 2(2): 511. 1912.

镇江白前 zhen jiang bai qian

*Tylophora sublanceolata* Miquel, *Ann. Mus. Bot. Lugduno-Batavum* 2: 128. 1866; *Vincetoxicum sublanceolatum* (Miquel) Maximowicz.

Stems twining, to 1.5 m, pubescent along 2 lines, glabrescent. Leaves opposite; petiole ca. 5 mm; leaf blade lanceolate or narrowly oblong, 3–5 × 2–2.8 cm, base rounded, apex short acuminate, glabrescent or puberulent along veins. Inflorescences umbel-like, ca. 1.5 cm. Sepals lanceolate, ca. 2.5 × 1 mm, glabrescent. Corolla purple, rotate; lobes lanceolate, ca. 3.5 × 1 mm, glabrous. Corona shorter than anthers; lobes ovate, fleshy. Pollinia oblong. Follicles lanceolate in outline, ca. 7 cm × 7 mm, glabrous. Seeds ovate, ca. 3 × 2 mm; coma ca. 2 cm. Fl. Mar-Aug, fr. Sep-Dec.

- Thickets, open woodland. Jiangsu (Zhenjiang) [Japan].

**56. *Cynanchum fordii*** Hemsley in F. B. Forbes & Hemsley, *J. Linn. Soc., Bot.* 26: 106. 1889.

山白前 shan bai qian

*Vincetoxicum fordii* (Hemsley) Kuntze.

Stems twining to 2 m, pubescent along 2 lines. Leaves opposite; petiole 0.5–2 cm; leaf blade oblong or ovate-oblong, 3.5–10 × 1.5–5 cm, sparsely pubescent, base truncate, rarely subcordate or rounded, apex short acuminate; lateral veins 4–6 pairs. Inflorescences extra axillary, corymbose or umbel-like, ca. 4 cm, to 15-flowered. Sepals ovate-triangular,

Hubei, Hunan, Yunnan.

**57. *Cynanchum volubile*** (Maximowicz) Hemsley in F. B. Forbes & Hemsley, *J. Linn. Soc., Bot.* 26: 109. 1889.

蔓白前 man bai qian

*Vincetoxicum volubile* Maximowicz, *Mém. Acad. Imp. Sci. Saint-Petersbourg Divers Savan* 9: 195. 1858; *Alexitoxicon volubile* (Maximowicz) Pobedimova; *Antitoxicum volu-*

*bile* (Maximowicz) Pobedimova.

Stems twining to 3 m, pubescent along 2 lines at base of internode, 1 line disappearing along the upper part of node. Leaves opposite; petiole ca. 1 cm; leaf blade oblong or oblong-lanceolate, 4–10(–15) × 1.2–3(–4.5) cm, papery, glabrescent or pubescent along veins, base truncate to shallowly cordate, margin ciliate, apex acuminate; lateral veins 7–10 pairs. Inflorescences umbel-like to short, lax, racemelike, to 6 cm; peduncle 0–3.5 cm, glabrous. Pedicel 1–1.7 cm, glabrous. Sepals lanceolate, 2–2.3 × 0.5–0.7 mm, ciliate. Corolla white, rotate; tube ca. 2 mm; lobes linear-lanceolate, 4–6 × 1.3–1.7 mm, glabrous outside, densely pubescent inside. Corona lobes ovate-triangular, apex acute. Pollinia ovoid. Stigma head depressed. Follicles lanceolate in outline, ca. 5 × 1 cm, glabrous. Fl. Jul-Sep, fr. Aug-Dec.

Moist grasslands. Heilongjiang (Mishan and Yiehun) [Korea, E Russia].

